Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XII.---No. 7. (NEW SERIES.) NEW YORK, FEBRUARY 11, 1865. $3 PER ANNUM (IN ADVANCE.)

Automatic Stop-motion for Steam Engines.

When the governor was first applied to the steam engine, it was as great an improvement as rendering the valves self-operating. Previous to the adoption of this detail the machine ran unevenly. Like a pulley hung out of truth, it moved fast and slow and was altogether a crude affair.

When Watt adopted the common two-ball governor on his engines, the defect spoken of was remedied and the value of the steam engine as a motive power was very greatly increased. From his day, up to the present time, it has been the object and aim of inventors to render this detail of the wondrous machine what its name signifies—the controller of its movements and watchful guardian of its every stroke.

From merely admitting steam to the steam chest, from whence the slide valve admitted it to the cylinder, ingenious men began to ask themselves whether it could not be directly connected to the main valve and thus exert a more direct influence upon the velo city of motion and govern the strokes with greater nicety.

In the Corliss and other engines this idea is carried out, and the modifications which the old-fashioned two-ball governor has undergone have not changed its character but merely enlarged the sphere of its usefulness.

The engravings published in connection with this article show still another duty that can be performed with the governor. It is a very important one, and for want of this simple arrangement thousands of dollars have been expended in repairs, and many working days lost to the operatives. When the belt of the governor slips off or breaks—which very often happens—the engine is uncontrolled, and it takes advantage of this fact and runs away. If the engineer happen to be standing by the throttle valve he can close it immediately and prevent the damage which is likely to ensue. But the engineer is not always at the post in question, for he has many duties to perform which render his presence at the point indicated simply impossible, therefore some self-acting sure-working device to supersede the necessity of the engineer standing in one place to guard against an exigency which may occur at any time and may not happen for months, becomes quite apparent.

Regularity of motion is, in most factories, a paramount consideration; therefore, if the governor be thrown out of action by breaking the belt, the speed instantly runs up. In cotton mills the greatest confusion is caused by this accident; in flouring mills it is also exceedingly injurious, and even in machine shops we have seen belts torn off and wound up in a tangled mass from rapid increase in the velocity of the shafting. All manufacturers, however, know very well that breaking the governor belt is by no means an unusual occurrence, and we therefore proceed to the consideration of the engravings.

Fig. 1

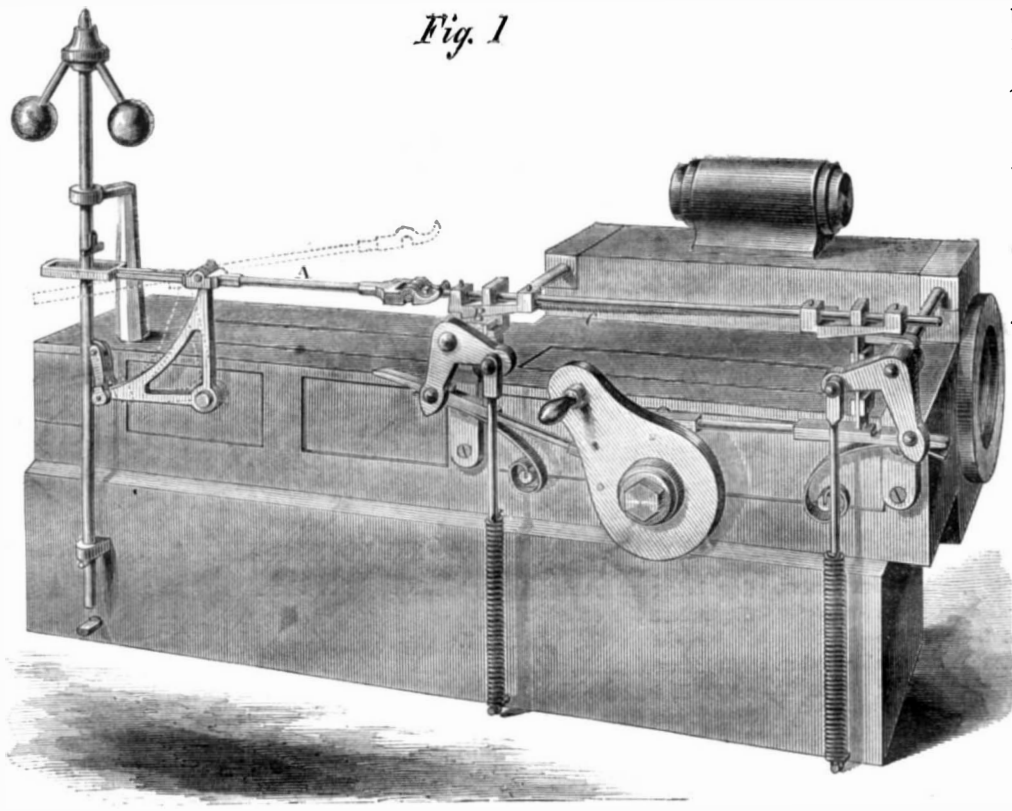
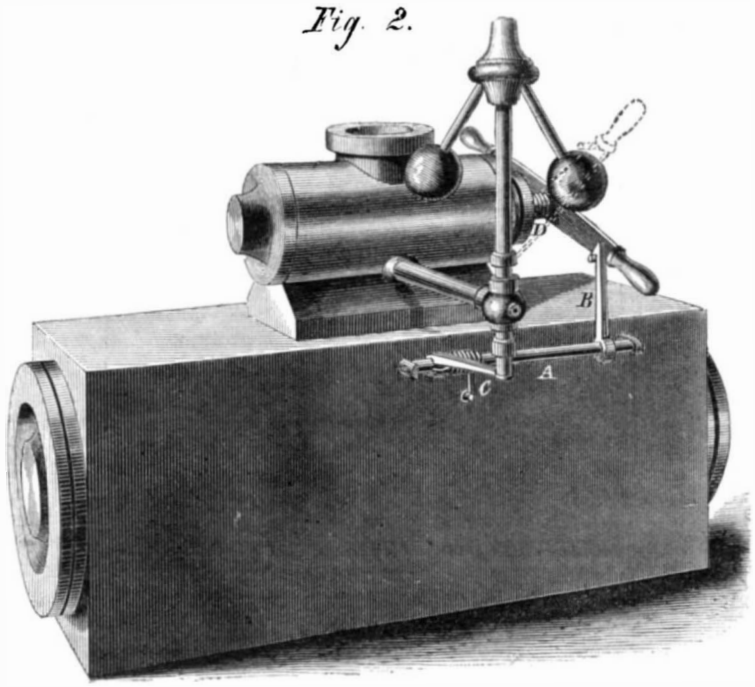


Fig. 2.



AUTOMATIC STOP-MOTION FOR STEAM ENGINES.

The object of this invention is simply to use the governor to stop the engine when the belt slips off or breaks, and thus do what is necessary to be done *on the instant.* It also provides a means of stopping the engine from any one room of the factory, for not unfrequently the main belts, transmitting motion from one room to another, run off the pulleys; before communication can be opened with the engineer much damage ensues which ought to be avoided.

All of these objects are effected by a very simple means, as will be seen by referring to the several engravings.

FIG. 1.—PATENTED AUG. 24, 1858.

With this arrangement, in case the regulator belt should break or slip on the pulley, the balls drop down and trip the lever, A; this lever is in connection with the incline plane rod, B, liberating the lever, which is thrown forward by means of a weight or spring, C, far enough to trip the hooks from off the catches. The same result may also be obtained by attaching a wire to the lever, thus enabling a person in any room to stop the engine in case any one should be caught by belts or gear, or in case an accident to the machinery should render it necessary to stop the engine immediately.

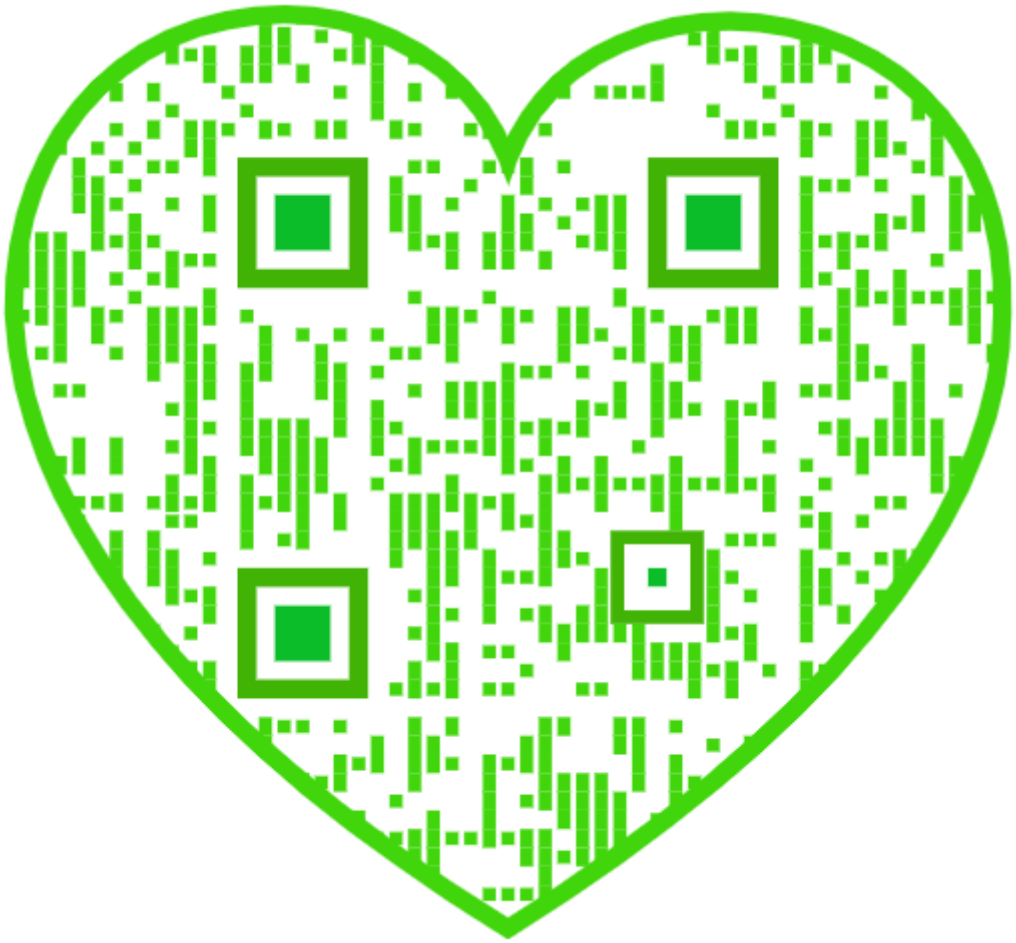
FIG. 2.—PATENTED OCT. 21 1862.

This engraving represents a method for stopping the engine by shutting off the steam through the action of the throttle valve. It can be applied to any kind of engine, new or old. The arrangement is merely a shaft, A, and an arm, B. This arm catches over a pin in the handle of the throttle valve. When the governor belt breaks or runs off, the balls fall and trip the catch by the arm, C: a spring, D, on the throttle valve shaft then closes the valve immediately, as shown by the dotted lines.

FIGURE 3.

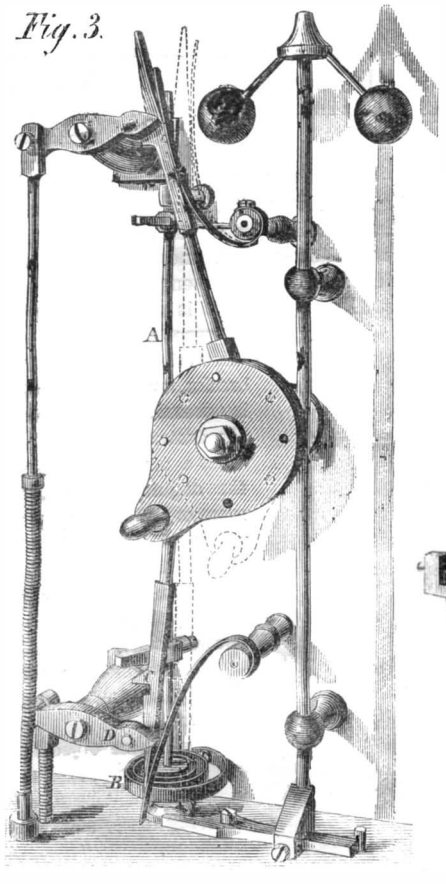
This arrangement is applicable to an upright engine. In case the driving band should slip on its

© 1865 SCIENTIFIC AMERICAN, INC.



pulley or break, the regulator balls drop down far enough to trip a lever (not shown) by means of an inclined sliding piece made to work in or out of the way, as occasion may require. This action liberates a ratchet gear on the end of the upright shaft, A, thereby causing the shaft to turn round by means of a spring, B, far enough to throw back the hooks, C, from the pins, D. These hooks operate the main

Fig. 3.



spring attached to draw up the back end of the trip lever, B, far enough to depress the shoes, C, from their catches. The springs are so fixed in every case as not to affect the free action of the governor.

FIGURE 6.

This arrangement is applicable to engines of the Green patent, but may be applied to others of various kinds. In the case of the Green engine, if the governor belt breaks or slips, the shaft moves up far enough to throw out the lever, A, from its groove, B (see section), thus liberating the shaft, which is thrown down by means of a spring, C, far enough to depress the tappets, so they will pass by the catches. Some springs are made so as to be inside of the coupling, being much more sightly in this way than where they are on the exterior.

Fig. 4.

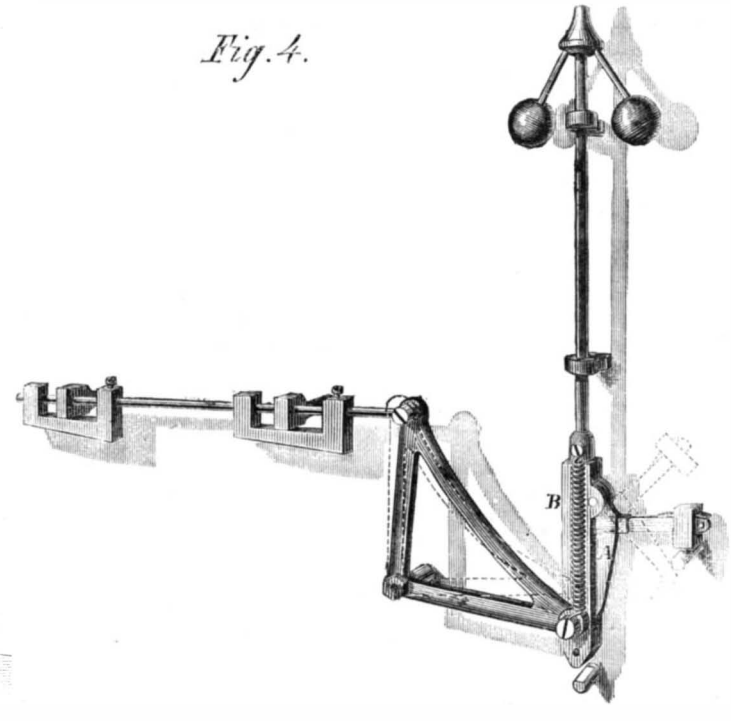
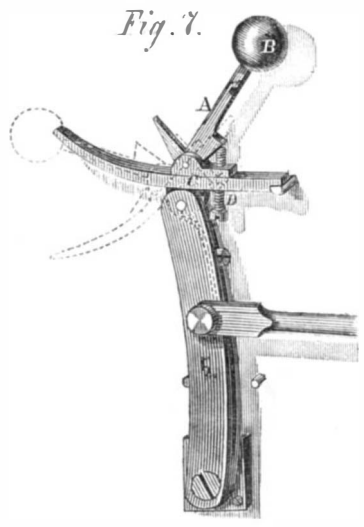


FIGURE 7.

This is a straight or bent lever, A, terminating in a ball, B, both attached to a shoe, C, with a regulating screw, D, for adjusting the position of the lever, A, so that it may be set at any required angle. In case of an increase of speed this ball will be thrown over far enough to trip the shoe off, as shown by

Fig. 7.



dotted lines. On the Green engine it may be attached to the sliding bar for the purpose of depressing the tappets so that they may pass without catching. This is entirely independent of the regulator.

FIGURE 8

This arrangement is a forked lever, A, one end of which is attached to the regulator stand, B, the other end is supported by a spiral spring, C. The forked lever, A, is put in operation by the trip lever, B, by means of the button or arm, D, which may be turned up or down. When the regulator drops down it depresses the forked lever far enough to liberate the shoes, E, from the catches. The invention, however applied, in no way interferes with the free action of the regulator, and a wire may, in all cases, be attached to the stop motion so as to stop the engine from any room or from a distance of several blocks of buildings.

Applications for patents are now pending on the several plans above illustrated which are not specified as being already patented. For further particulars address the Automatic Stop-motion Company, Newburyport, Mass.

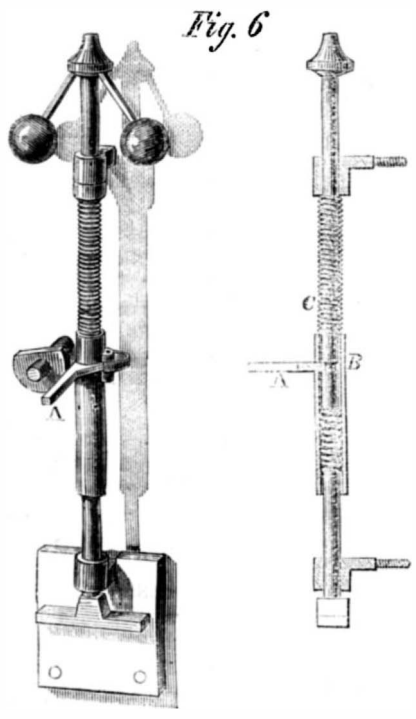
AUTOMATIC STOP-MOTION FOR STEAM ENGINES.

valves which, of course, cease moving when the two are disconnected.

FIGURE 4.

This arrangement is applicable to a double engine. In case the regulator belt should break or slip on its

Fig. 6



pulley, the balls would drop down far enough to liberate the straight or bent arm, A, thereby causing a pin in the slotted coupling to be released and drawn up by means of the spring, B, throwing the inclines far back enough to depress the hooks from their catches, thus stopping the engines.

FIGURE 5.

When the regulator, from any cause, drops down, the hook, whose lower end is an incline, strikes upon a cam, A—which may be turned up or down at pleasure—and is thrown off from its pin, thus enabling a

HOW TO DETECT COUNTERFEITS.

We have received from the authors, Messrs. E. J. Wilber and E. P. Eastman, of the Commercial College, Poughkeepsie, N. Y., a copy of their treatise on counterfeit bank notes. It is an elegant little volume of 50 pages, gilt edged, handsomely bound in red cloth, and illustrated with a large number of fine copper and steel plate engravings made by the New York Bank Note Company. The several parts of a bank note are minutely described, and the differences between the genuine and the counterfeit are fully pointed out. As a sample of this work we extract what is said in relation to portraits:—

"In no department of the counterfeiter's art has he met with more signal failure than in attempting to delineate the 'human face divine,' which, as one has beautifully and truthfully observed, 'is the painted stage and natural robing-room of the soul.'

'GENUINE.—In the true bill, the mouth, eyes and face have an expression clear and distinct.

"The hair, even in its most delicate wavings and strands, is accurately copied. The hands, and especially the fingers, will be found proportioned to the

Fig. 5.

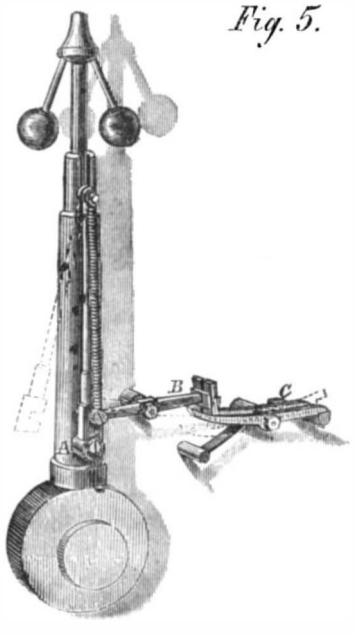
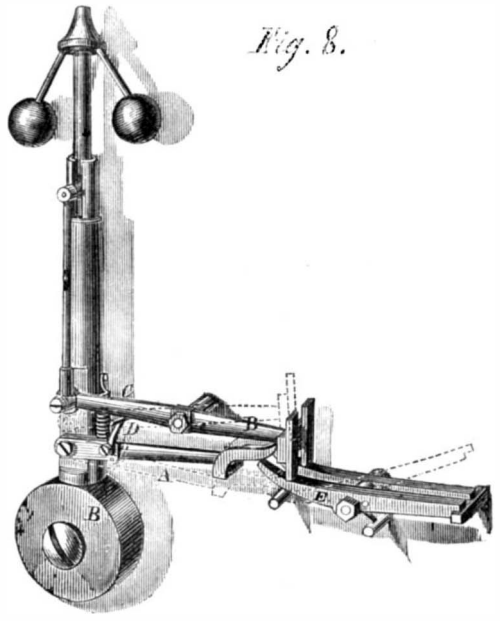


Fig. 8.



© 1865 SCIENTIFIC AMERICAN, INC.

figure. The texture of the skin has not escaped attention, and indeed, in every respect, to the very minutiæ of detail, the portrait will bear close scrutiny.

"The more familiar portraits, as those of Washington, Franklin, Clay and Webster, 'the old familiar faces,' will strike the eye at once as being accurate, and the longer and more critically observed, the more perfect will the resemblance appear.

"COUNTERFEIT.—In the counterfeit, the eye will be found not unfrequently without a pupil; the delicate lines about the mouth omitted or constrained so as to give a rigid and unnatural expression to that very important feature of the face; black lines encircle the head, spots and broken lines appear the cheek and neck, none of which are seen on genuine notes. Bank-notes may be so nearly worn out, it is true, as to make it no easy task to trace and follow out the symmetry and fineness of all parts of the portrait; but if any portion of the portrait is left entire, our remarks will be found applicable to that portion."

Price of the work two dollars.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Stills for Petroleum and other Liquids.—This invention is the subject of three patents. The first is for making a combustion chamber in the furnace of stills, which rises upward within the retort, and thereby heats the body of the charge in the retort within, while the charge is also exposed to heat on the outside of the retort. The second is for surrounding the retort of a still outside of the flue space with a jacket of non-conducting material to prevent the loss of heat ; also in the use of steam for cleaning the retort from residuum or sediment which may collect on its bottom; also in a peculiar construction of furnace by which air is supplied to and mixed with gas before they issue from the fire surface of the furnace. The third patent is for placing a movable furnace below a still, so that the heat can be regulated; also in the construction of a hollow furnace for using gas and air combined, and which are mixed in the furnace itself, and delivered through holes in the top plate of the furnace. G. H. S. Duffus, of New Orleans, La., is the inventor.

Pump.—This invention consists in an oscillating vacuum pump whose valve is opened by means of the contact of the valve stem with an inclined plane below it, and closed by a spring. The joint of the valve stem is packed by means of an elastic ring, and the hollow journal which connects the cylinder with the receiver is also packed by a like ring. A. S. Lyman, of New York City, is the inventor.

Safeguard for Protecting Pottery Ware.—Pottery ware, during the process of burning or baking, requires to be protected from cinders, smoke and other substances which are liable to come in contact with it and impair its value. At present the articles or ware are placed within a cylinder made of fire clay, and provided with a close bottom, the articles being placed one over the other, and prevented from being in contact by means of rods or pins. The cylinders are made of various sizes, according to the size of the articles they are to receive, and are placed one over the other in the furnace, in rows or tiers. These cylinders, commonly termed safeguards or saggers, are attended with some disadvantages. In the first place it is rather difficult to adjust the articles in and remove them from the cylinders, and considerable room or space is lost by them, and the top article in each cylinder liable to be injured by fragments dropping from the bottom of the cylinder immediately above. These difficulties are fully obviated by this invention, which consists in forming the cylinders of a series of rings, provided with a flange or annular lip at their lower edges, and with a corresponding recess in their upper edges, so that one ring may be fitted over the other, a vessel or article to be burned or baked being fitted in each ring, and resting on pins thereon. Benjamin Jackson, Trenton, N. J., is the inventor.

Steam Boiler.—This invention relates to a new and improved application of a float to steam boilers. for the purpose of indicating the hight of the water therein, sounding an alarm when the water is below a certain level, and also, if necessary or desired, be made the means for putting in operation a pump to supply the boiler. The objection to the use of floats in steam boilers to indicate the hight of the water has been that they are frequently affected by the foam so as to be very unreliable. and further that the gage rod attached to the float and passing through a stuffing box or guides is so restricted in its free movement by friction as to render the action of the float very uncertain. This invention is designed to obviate these difficulties, and to this end it consists in isolating the float from the mass or bulk of water in the boiler and still have the float expand to the same influences of buoyancy and steam pressure as when in the boiler, whereby the float is rendered reliable by being placed beyond the action of foam. The invention consists further in connecting the float rod with a lever at the exterior of the boiler in such a manner as to avoid all inaccuracies due from friction, and at the same time form a perfect water-tight joint, where the rods, which form a connection between the float rod and the lever, pass through the casing or box in which the float rod is fitted or works. Joseph Yates, of Mott Haven, N. Y., is the inventor.

Portable Lantern.—This invention consists in combining a socket or spring to receive a candle, with a case having a glass front, and in such a manner that the tube may be shoved entirely within the case when the lantern is not required for use, and also adjusted so that the tube may serve as a handle when the lantern is in use and a handle is required. The case of the lantern is provided with a cover, which closes over the glass part and protects it when the lantern is not in use, and is capable of being raised to serve as a reflector when the lantern is in use. The invention is more especially designed for army or camp purposes, but it will prove a convenient device for general use, it being durable, and the case constructed in such a manner that no solder is required, which frequently melts under the heat of the flame, and causes the parts to become detached. Charles Deavs, assignor to Archer & Pancoast, of 9 Mercer street, New York City, is the inventor.

Folding Chair, Table, Etc.—This invention consists in a folding chair, table or other similar article, the seat or top of which is made of canvas or other flexible material, and supported by a series of radiating arms, which are hinged to a central hub, secured to the upper end of a longitudinally-sliding staff, in combination with hinged braces, connected to the radiating arms, and made to radiate from a sleeve through which the staff slides, and which is supported by hinged legs connecting by means of toggle arms with a ring fitted on the lower end of the central staff in such a manner that by expanding the legs and depressing the central staff the seat or top is expanded and rendered rigid, and at the same time the toggle arms assume such a position they retain the legs and prevent them from collapsing accidentally; but by slightly raising the center staff the toggle arms are brought in such a position that the chair, table or other article can be folded up with the greatest convenience and in a small compass. If desired, the legs and seat or top may be disconnected and each folded or expanded separately. Ferdinand Ludke, 287½ Bowery, New York, is the inventor.

Improvement in Mirrors.—We have lately examined some most beautiful specimens of mirrors prepared by a new process for which a patent has just been granted to Louis Paul Angenard, of New York city. The reflecting compound is made in the following manner:—Dissolve two-thirds of an ounce of platinum, by means of heat, in two and a half ounces of muriatic acid and one and one-sixteenth ounces of nitric acid. Evaporate the acids ; then pulverize the mass, reduce with alcohol, and apply the solution with a brush to the glass surface. The glass is then heated in an oven till it reaches the cherry-red color, when it is allowed to cool and the operation is finished. The whole process is exceedingly simple, quick and economical, and the resulting mirrors are of superior quality The adhesive properties of the compound are much superior to the ordinary silvering mixture and the reflecting surface seems to be more brilliant. This improvement promises to revolutionize the mirror business, as it facilitates the silvering or platinizing of the largest and finest kinds of mirrors, at a hundredth part of the present cost. Specimens may be seen at the establishment of Julius H. Pratt, No. 86 Chamber street, New York.

Furnace Grate Bar.—Furnace grate bars are usually cast with a groove in the edge so that the ashes will lodge therein and thereby the injurious effect of the heat on said edges is reduced. The ashes protect said edges to some extent from being burned. The object of this invention is to facilitate the manufacture of such grate bars by casting them in pairs or two simultaneously on one and the same core whereby the labor is considerably reduced and a better article is produced, and furthermore by the taking for the core a chill or a piece of metal, the surfaces of the grooves are chilled and their faculty to conduct heat is thereby considerably reduced so that the same are much better able to be exposed to the heat of the fire than grate bars cast in the ordinary manner. J. A. Miller, 200 Broadway, is the inventor.

Safety Valve Regulator.—The operation of this invention is as follows:—When the regulator is set to control say a pressure of steam of 50 lbs. on the boiler, on the pressure getting up to 51 lbs. it will act as the ordinary spring balance supposing that to be suddenly unscrewed to 48, and on the pressure getting up further to 52 lbs. it will act as the spring balance if that were further immediately unscrewed to 46 lbs., and so on for every pound of increase of pressure on the boiler the regulator will allow the steam to blow through the safety valve at a similarly increasing rate, and this action is reversed on the steam coming down to the proper working pressure. It can also be made to indicate the pressure of the steam in pounds from 1 pound upward. Peter Riordan, Washington, D. C., is the inventor.

Manufacture of Paper Boxes.—This invention relates particularly to an improvement in that class of boxes which have heretofore been made of pasteboard, and are used in mercantile houses and trades of almost every kind under the name of paper boxes. The high price of paper and pasteboard has made it desirable to find some other cheaper material which can be worked in the same manner as pasteboard, and this object has been accomplished by the present invention which consists in the employment or use in place of pasteboard, of slats of wood prepared by gluing or pasting two or more thicknesses of veneers one on the other, the grain of one veneer being made to run endways to the grain of the other, until a sheet is obtained similar in size to the sheet of pasteboard so used in the manufacture of boxes, in such a manner that said sheet of wood can be marked off, folded and cut up for a number of boxes precisely in the same manner as pasteboard. Fred. W. Fliedner, 17 and 19 Bowery, New York, is the inventor.

Coal Oil Stove.—The object of this invention is to obtain a simple and portable stove in which coal oil may be economically used as a fuel. Coal oil, as is well known, generates, burnt in a lamp for illuminating purposes, a great amount of heat, and where a draught chimney is used a greater amount of heat is evolved or radiated from the lamp than when an open or no chimney burner has been used, in consequence of a more perfect combustion being obtained with the chimney burner. This invention consists in using with a coal oil lamp, of any suitable construction, a draught chimney, and a draw arranged in such a manner that the heat evolved or radiated from the lamp may be advantageously employed for cooking or culinary purposes. It consists further in applying to the chimney a door and glass by which the lamp may be lighted and the flame regulated without removing the chimney from the lamp. C. H. Reichmann, of New York City, is the inventor.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given ; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds.

© 1865 SCIENTIFIC AMERICAN, INC.

EXTRACTS FROM HELMHOLTZ.

Among the collection of treatises on the Correlation of Forces, collected by Professor Youmans, by far the most readable is that of Professor H. L. F. Helmholtz, of the University of Heidelberg. From his essay we take the following extracts.

HEAT AND MECHANICAL FORCE.

In the collision and friction of bodies against each other, the mechanics of former years assumed simply that living force was lost. But I have already stated that each collision and each act of friction generates heat; and, moreover, Joule has established by experiment the important law, that for every foot-pound of force which is lost, a definite quantity of heat is always generated, and that when work is performed by the consumption of heat, for each foot-pound thus gained a definite quantity of heat disappears. The quantity of heat necessary to raise the temperature of a pound of water a degree of the centigrade thermometer, corresponds to a mechanical force by which a pound weight would be raised to the height of 1350 feet; we name this quantity the mechanical equivalent of heat. I may mention here that these facts conduct of necessity to the conclusion, that the heat is not, as was formerly imagined, a fine imponderable substance, but that, like light, it is a peculiar shivering motion of the ultimate particles of bodies. In collision and friction, according to this manner of viewing the subject, the motion of the mass of a body which is apparently lost is converted into a motion of the ultimate particles of the body; and conversely, when mechanical force is generated by heat, the motion of the ultimate particles is converted into a motion of the mass.

DIFFERENCE IN TEMPERATURE.

Besides the mathematical form in which the law was first expressed by Carnot, we can give it the following more general expression;—"Only when heat passes from a warmer to a colder body, and even then only partially, can it be converted into mechanical work."

The heat of a body which we cannot cool further, can not be changed into another form of force; into the electric or chemical force, for example. Thus, in the steam engine, we convert a portion of the heat of the glowing coal into work, by permitting it to pass to the less warm water of the boiler. If, however, all the bodies in nature had the same temperature, it would be impossible to convert any portion of their heat into mechanical work. According to this, we can divide the total force store of the universe into two parts, one of which is heat, and must continue to be such; the other, to which a portion of the heat of the warmer bodies, and the total supply of chemical, mechanical, electrical, and magnetical forces belong, is capable of the most varied changes of form, and constitutes the whole wealth of change which takes place in nature.

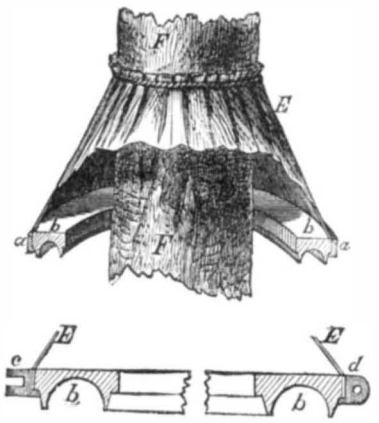
THE FINAL RESULT.

But the heat of the warmer bodies strives perpetually to pass to bodies less warm by radiation and conduction, and thus to establish an equilibrium of temperature. At each motion of a terrestrial body, a portion of mechanical force passes by friction or collision into heat, of which only a part can be converted back again into mechanical force. This is also generally the case in every electrical and chemical process. From this, it follows that the first portion of the store of force, the unchangeable heat, is augmented by every natural process, while the second portion, mechanical, electrical, and chemical force, must be diminished; so that if the universe be delivered over to the undisturbed action of its physical processes, all force will finally pass into the form of heat, and all heat come into a state of equilibrium. Then all possibility of a further change would be at an end, and the complete cessation of all natural processes must set in. The life of men, animals, and plants could not of course continue if the sun had lost its high temperature, and with it his light,—if all the components of the earth's surface had closed those combinations which their affinities demand. In short, the universe from that time forward would be condemned to a state of eternal rest.

THE *Invalide Russe* says: A fourth enormous cannon of iron was lately cast at Petrozavodak, in Russia, on the American system—that is to say, by cooling the inside with water.

MERRITT'S TREE PROTECTOR.

The man who has seen his apples and elms annually stripped of their foliage by canker worms, and gradually withering beneath the devouring hosts of these insects will be glad to know that their pathway up the trunks of his trees can be effectually barred. The little apparatus illustrated in the annexed engravings is said by eminent entomologists to be an effectual protection against the attacks of the canker worm.



Francis G. Sanborn, Esq., Massachusetts State Entomologist, thus describes the insect:—

"The *Anisopteryx vernata*, the canker warm, as it is called, is a small ten-footed naked caterpillar, belonging to the family of geometers, or span worms. They derive this name from their peculiar mode of progression, which is effected by grasping the surface of the bark or other substance on which they may be placed, with the six fore-feet, the body being extended in a straight line; the two pairs of hinder feet are then brought nearly up to the spot occupied by the others, the body in this position forming a loop, and the animal closely resembling the letter U.

"The parents of this creature are of entirely different form, the male being a delicate gray moth, with slender body, six feet, and four thin silky wings; and the female of similar color, but wingless, and with a much larger body, having six very slender feet.

"After the 1st of October she emerges from the ground and ascends the trees, for the purpose of depositing her eggs. During the winter months every warm and sunny day will discover many of the females slowly crawling up the trees and fences, while the males may be seen hovering around them, pairing, or resting on the bark, with their wings folded flatly back, forming a triangular figure. The eggs are now being laid in flat patches on the surface of the bark or fence in clusters of sometimes more than a hundred."

This apparatus is designed to prevent the female moth from crawling up the trunk of the tree. A small tent-shaped circle of cloth, E, is secured at its upper end around the trunk, F, of the tree, by means of an elastic band of gutta percha or india-rubber. The lower edge of the cloth supports a smooth ring of glass, *b*, which has a channel formed in its lower surface. This channel proves an impassible barrier to the wingless female moth, and, consequently, no eggs can be laid above the point where the apparatus is attached. After the worm is hatched, if it attempts to climb the tree, the smooth, inverted groove presents an equally effectual barrier to his progress.

The glass ring is made in two sections, and is secured to the cloth by a band, *a*, of iron, which is drawn together at its ends by means of a screw.

The worm that is so destructive to elms and other trees in this city and Brooklyn, though of the same genus as the canker worm, is of a different species, being named by Harris *Geometra niveosericearia*. The female moth of this insect is provided with wings, and she lays her eggs on the branches of trees, consequently an apparatus that would prevent moths and worms from crawling up the trunks of trees, would have no effect in stopping the ravages of our measure worm. But as the female moth of the canker worm has no wings, it is only necessary to cut off her course and that of her offspring up the body of the tree, to protect the tender foliage from their voracious and multitudinous maws. We should therefore suppose that this apparatus must prove an effectual protection to trees from the ravages of the canker worm.

It was patented by Benjamin Merritt. Jr., of Boston,. Mass., on the 15th of November, 1864, and further information in relation to it may be obtained by addressing The American Tree Protector Company, at No. 19 Phœnix Building, Boston, Mass.

The Steam Machinery of the Navy.

The following appears in the Washington correspondence of the *New York Herald*:—

THE REPORT OF THE NAVAL COMMITTEE.

The Naval Committee of the House of Representatives has just unanimously adopted the report of its chairman, Mr. A. H. Rice, on the subject of the resolution introduced during the last session by Winter Davis, on the condition of naval machinery built by Mr. Isherwood, the Chief of the Bureau of Steam Engineering; the causes of the failure of the machinery of the Pensacola, from the plans of Mr. E. N. Dickerson, and the administration of the engineering department of the navy, including the sweeping charges of fraud and incapacity. The resolutions were offered by Mr. Davis, at the instance of Mr. E. N. Dickerson, well known for his attacks in the newspapers and pamphlets on the Bureau of Steam Engineering and the Navy Department. The report of Mr. Rice is an elaborate one. The most searching investigation was instituted in both the management of the Bureau of Steam Engineering and the merits of the machinery constructed by it, the result of which, as given in Mr. Rice's report, is a complete vindication of its character in both respects. It shows the machinery to be up with the latest improvements, and that the mode adopted of using the steam, with a very moderate measure of expansion, is in accordance with the most recent scientific researches and practical experiments, and has the endorsement of all able and experienced engineers. The comparison of this machinery with that previously constructed for our navy, and for the French and English navies, and for the merchant marine, shows an incontestible superiority and a greater speed of vessels. The report also shows that the machinery of the Pensacola was renewed by the department only after the most earnest endeavors to make it so far successful as to admit of use with the slowest admissible speed of a vessel. An examination of over forty witnesses failed to give any color, even the slightest, to the charges of fraud and incapacity; but proved, on the contrary, that the Government interest could not possibly have been better protected, both as to cost and character of the machinery.

Interesting to Physiologists.

In a letter to the London *Globe*, Dr. Kidd mentions the following instance of the restoration of sight in a young womon born blind. He says:—"I saw individually, and observed with interest, the following case a short time ago at the Eye Institution, Moorfields—a case that would be invaluable to Berkeley, as bearing on the part played by the senses in intellect, etc. An interesting-looking young woman, twenty-two years of age, born stone blind—partly educated in the family of a clergyman, all this time by finger alphabets, as we see blind men tracing the letters in one or two places in town—blind for twenty-two years, was restored to perfect vision in four days by a surgical operation, and to partial vision in two minutes. This young woman in an instant, having been twenty-two years and from her birth stone-blind of congenital cataract, began to see, as these deaf mutes in Paris begin to hear for the first time. The effect in the young woman was most curious, and something of this kind. She saw everything but there was no idea whatever of perspective. She put her hand to the window to try to catch the trees on the other side of the street, then in Moorfields; she tried to touch the ceiling of a high ward; she was utterly ignorant also of common things—*e.g.*, what such things as a bunch of keys were, of a silver watch or a common cup and saucer; but when she shut her eyes and was allowed to touch them (the educated sense) she told them at once! She could almost distinguish the greasy feel of a silver half-crown from the cold, dry harsh feel of a copper penny. Her joy was excessive when shown some mignonette and sweet pea that one of the surgeons had accidentally in his coat, for it seemed she knew all the plants in the clergyman's garden by the touch and smell! She looked at the bunch of keys, and with equal blankness at the flowers, then shut her eyes so as to recognize

© 1865 SCIENTIFIC AMERICAN, INC.

them. All this took up less then five minutes, But she failed to say, as well as I now remember the case, these are flowers. But on my saying when she opened her eyes again "why, these are flowers," "Oh! so they are," she replied, shutting her eyes again quickly and putting them to her nose, "This is mignonette," etc.

CONDITION OF NEW YORK MACHINE SHOPS.

We have recently visited the leading machine shops in this city for the purpose of ascertaining the quantity of work on hand for the ensuing year, and were surprised to find them generally dull. The great bulk of the Government work, on new steamers and frigates, has been done, and the shops are finishing up their old contracts preparatory to taking others. At the—

ALLAIRE WORKS

is building the *Madawaska*, a government frigate, having cylinders 100 inches diameter and 4 feet stroke. These engines are from designs by Capt. Ericcson, and are built on a peculiar plan; they are perfectly balanced and expected to obtain a high rate of piston speed. The North River steamer, *Francis Skiddy*, is receiving new boilers and having a general overhauling done to her engine.

A new beam engine for a ship soon to be launched by Mr. Westervelt is in progress; it will have a cylinder 56 inches in diameter by 11 feet stroke, fitted with Herman Winter's rotary cut-off. A beam engine of 90 inch cylinder and 12 feet stroke has just been completed; also one beam engine 68 inches diameter and 11 feet stroke for steamer *Orient*. The engine of the steamer, *City of Buffalo*, formerly on Lake Erie, has been transferred to the steamer *Moro Castle*, running between this city and Havana; several gunboat boilers are also building. At—

PEASE AND MURPHY'S.

Very little is doing beyond repairing and building a number of boilers. At the—

ETNA IRON WORKS.

The steam ram *Dunderberg*, building by William H. Webb, Esq., is receiving her machinery. The shaft and propeller are in place, and the rest of the engine is in various stages of progress. They have also at these works a pair of engines for the Government; the cylinders are 100 inches diameter by 4 feet stroke, also three pair of propeller engines 60 inch cylinders by 36 inches stroke for Government sloops of war.

Also one beam 100 inch cylinder and 12 feet stroke for steamship *Day Star*. At the—

NEPTUNE IRON WORKS

there is one beam engine building having a cylinder 85 inches diameter by 12 feet stroke of piston, for the China trade; also one 66 by 12, for the same.

This concern has just completed one beam engine of 60 inches diameter in cylinder by 12 feet stroke, for an English firm in China.

For the last ten years our American engine builders have been building machines for steamers in the China trade almost as fast as they could send them out. Messrs. Boardman, Holbrook & Co., of the Neptune Iron Works, have built 15 engines of large size, and numerous others have been sent out there by different parties, so that by this time the waters of the China sea, and rivers tributary thereto, must be pretty well covered with specimens of our handiwork.

MORGAN IRON WORKS.

The above firm have two engines 60 inch by 11 feet stroke for the Mexican Mail S. S. Company, and four beam engines 44 inch cylinder by 11 feet stroke, for parties not named; also one government frigate engine 100 inch cylinder and 4 feet stroke.

The *Idaho*, a government vessel, is also building here. The engines are from designs by Mr. E. N. Dickerson, and have cylinders 36 inch diameter by 8 feet stroke. The cylinders four in number set athwart-ships, one pair on each side of the keel. There are two screws one under each quarter, and a high piston velocity, no less than 800 feet per minute, is expected to be obtained. This vessel has peculiar boilers, also by Mr. Dickerson; they have been tried and found to make steam rapidly.

A New Use for Castor Oil.

A gentleman whose attention had been directed to the use of castor oil as a dressing for sheep, says the *Dublin Agricultural Review*, called here the other day in order to state a fact regarding the use of castor oil which he considered might be of service to the public.

Some time ago our informant was secretary to an orphan institution, where a large number of children were educated and boarded on the premises. That annoying disease, ringworm, broke out amongst them, and, notwithstanding all the efforts of the medical men connected with the institution, it could not be got under. When matters were in this state, a tradesman, who was employed upon some repairs in the house, told the matron that his children had been cured by an application of equal parts of castor oil and train oil. The remedy was simple and easily tried; and the result was that in a very short time not a trace remained of the disease among the children. The two oils were mixed together and applied daily.

Such is the substance of the information we received and we hope it will be found useful wherever an occasion arises requiring to put it in practice.

Rules for Finding Gears to Cut Given Threads.

Mr. W. B. Hatch, of Utica, N. Y., furnishes the following rule for cutting screws in engine lathes:—

RULE.—Divide the number of threads to cut by the pitch of feed screw; the quotient will be the ratio of the two wheels. If the ratio be a fraction, select for a driver a wheel into which the denominator will divide even, and multiply the driver by the ratio, the product will be the wheel driven. If the number of threads to cut be less than the pitch of the feed screw, divide the feed screw by the thread to cut, and reverse the position of the wheels.

Examples.—1. To cut 14 threads, feed screw 8, $14 \div 8 = 1\frac{3}{4}$, the ratio; the denominator, 4, will divide even in 20; then $29 \times 1\frac{3}{4} = 35$ for wheel driven.

2. To cut $19\frac{1}{2}$, feed screw 8. $19\frac{1}{2} \times 8 = 2\frac{7}{16} = 78$ for wheel driven.

3. To cut 3, feed screw 8. $8 \div 3 = 2\frac{2}{3}$. 3 will divide even in 21; then $21 \times 2\frac{2}{3} = 56$, and by reversing the position of the wheels, we have 56 for driver and 21 for wheel driven.

In cutting a screw in a lathe the feed screw forms one term of a ratio, and the thread you wish to cut forms the other term. The driving wheel represents the term formed by the feed screw; the leader or wheel driven represents the thread to cut. It is evident, therefore, that the number of teeth on the driver must be a multiple of the feed screw. The number on the leader must be a multiple of the thread to cut, or it must be a multiple of the prime factors of the terms which it represents. For example: to cut 14 to the inch, unless your feed screw is a multiple of 7, the prime factor in 14, your leader must be a multiple of 14 or 7. It is evident, also, that if you preserve the ratio it is immaterial how much you increase or diminish the numbers representing its terms, we may therefore multiply or divide both terms by the same number and preserve the ratio.

Example—Let 7 and 8 be the terms of a ratio; we see that 7×6 and 8×6 have the same relation, as also $7 \div 6$ and $8 \div 6$. We may thus vary at pleasure the number of teeth in our gears, being careful to preserve the ratio.

It is sometimes necessary for double-geared lathes to form two ratios which shall equal the one given. This may be readily done by multiplying both terms by any easy multiplier which will enable you to divide the products and thus obtain two wheels to represent each term

Example—Terms of ratio 8 and 7; multiply both by 100. $8 \times 100 = 800$, and $7 \times 100 = 700$, then $800 \div 40 = 20$; giving 40 and 20 for one pair of wheels, and $700 \div 25 = 20$, giving 35 and 20 for the other pair.

From these general principles we may derive the following rules for single and double-geared lathes.

For Single-geared Lathes.—Multiply the pitch of the feed screw, and the thread you wish to cut by the same number, using any number which will produce such gears as you have, the product by the feed screw will be the driver; the product by the thread to cut will be the leader. Or you may select for your leader a wheel which is a multiple of the thread you wish to cut; divide the number of teeth by the thread to cut, and multiply the quotient by the pitch of the feed screw; the product is the driver.

Example—To cut 9 to the inch, feed screw 5. $9 \times 5 = 45$ for leader, and $5 \times 5 = 25$, for driver. Or by rule second: leader $45 \div 9 = 5$: then the quotient 5×5, feed screw, $= 25$, the driver.

NOTE.—For fractional threads you may reduce both terms to improper fractions with equal denominators, then proceed with the numerators as with whole numbers.

2. To cut $9\frac{1}{2}$, feed screw 5. $9\frac{1}{2} = 19 \div 2$ and $5 = 10 \div 2$, then $19 \times 2 = 38$, leader, and $10 \times 2 = 20$, driver, or $19 \times 3 = 57$, leader, and $10 \times 3 = 30$, driver.

3. To cut $7\frac{3}{4}$ feed screw 8. $7\frac{3}{4} = 31 \div 4$, giving leader 31 and driver 32.

For Double-geared Lathes.—Proceed as in rule first for single geared lathe, only using a larger number for a multiplier, then divide the product found by the thread to cut, by any wheel which is a multiple of that thread, which will divide without a remainder, the divisor is one leader, the quotient is the other; then divide the product found by the feed screw by any wheel which is a multiple of the feed screw which will divide this product without a remainder the divisor is one driver, the quotient is the other.

Example—To cut 29, feed screw 8. $29 \times 100 = 2900 \div 58 = 50$, and $8 \times 100 = 800 \div 40 = 20$, getting 58 and 50 for leaders, and 40 and 20 for drivers.

2. To cut $11\frac{1}{2}$, feed screw 5. $11\frac{1}{2} \times 200 = 2300 \div 46 = 50$ and $5 \times 200 = 1000 \div 25 = 40$.

3. To cut $\frac{1}{2}$ thread, feed screw 4. $\frac{1}{2} \times 800 = 400 \div 20 = 20$, and $4 \times 800 = 3200 \div 64 = 50$.

NOTE.—In the above examples I have used 100, 200 and 800 for multipliers, simply because they are easy and convenient. If your change wheels are larger or smaller, use any number for multiplier which will produce the desired result.

W. B. HATCH.

Utica, Jan. N. Y.

[In our own practice we have always been cautious about relying on any rules until we have proved them. It is one thing to figure a train of wheels to cut a given thread, but it does not always follow that the result obtained by calculation is the true thread. In even numbers there is scarcely a chance for error, but with fractional threads, old lathes and leading screws cut in a hundred different shops, it is best to try every rule on an old piece of iron before executing the work in hand.—EDS.

A New Source of Iodine.

The *Mechanics' Magazine*, speaking of new sources of several rare substances, says:—"Another interesting example is the discovery of a mineral source of that very valuable substance, iodine. The ocean is the great storehouse of this element, all sea-water containing the iodides of sodium and magnesium, but only in such small relative quantity that to extract iodine directly from sea-water is not practicable, and hence sea-weeds, which have the power of attracting it from the element in which they live and assimilating it into their own substance, have hitherto formed the sole commercial source of it. Chemists have been aware of its existence in certain Mexican silver ores, in various land plants growing near the sea, in sponges, and in the oil of the liver of various fishes; but none of these bodies, animal, vegetable, or mineral, contains it in such quantities as would pay for extraction. There is said, however, to have been lately discovered in Chili a mineral consisting of a mixture of iodide of lead with the oxide and chloride of that metal in such proportion as to contain ten per cent of iodine. This mineral is believed to exist in considerable abundance, and if it really does so a great reduction in the commercial price of iodine must be a speedy result of its discovery. Such a result would be a great boon to the art of photography, and also to that of dyeing, since the brilliant dye recently discovered by Dr. Hofmann, though the first, will doubtless not be the last, having this element among its constituents.

LIEBIG, the celebrated German chemist, has gone to London to superintend the application of the sewerage of London to the purposes of agriculture. Millions of dollars' worth of manure are annually wasted in that and other large cities, and the land robbed of its natural fertilizers by neglecting to secure the drainings from large and populous places for manures.

© 1865 SCIENTIFIC AMERICAN, INC.

Correspondence

Peat as a Fuel.

MESSRS. EDITORS:—Our attention has been called to an article in the *Artisan* on the subject of "Peat as Fuel." Judging from our own experience, the statement made is calculated to mislead the public by attaching a greater value to it, as fuel, compared with other kinds of fuel, than facts will justify.

The writer of that article says:—"Peat is selling here (Boston) freely at $9 per chaldron, and is actually preferable to the best cannel coal."

We should regret to say one word to discourage its use, and we have once before, through your paper, called the public attention to the use of peat as a valuable fuel, and suggested that there were large quantities of it throughout the New England States where it was hardly known. We commenced using it about eight years ago for annealing our iron wire. Since that time we have taken out of our meadows and applied to various uses in our works seven thousand cords. This large consumption has, perhaps, enabled us to speak on the subject of its relative value, compared with other fuel, as advisedly as those who have had but a limited experience. During all these years we have been burning coal, wood and coke in quite as large quantities. We have made repeated experiments to determine how it would compare with these different kinds of fuel, and the result has been that eighty bushels of peat would produce about as much heat as one cord of chestnut or hemlock wood.

It should, however, be remembered that there is a difference in the quality of peat in different localities. Our peat will average as good as any which we have ever seen in this country. The writer, while in Ireland, examined the peat of that country and found it, as well as could be judged, fifty per cent better than ours.

We have tried all the different modes for taking out and preparing peat or use—as cutting out with a common peat knife and leaving it to dry in the sun while the pieces were standing on one end; the pieces were cut about five inches square, fourteen inches long. We have also made what is called hand peat—a very tedious process—without much increasing its value. The process of pressing we have tried to some extent; this, too, will not pay unless for some purpose requiring a much greater density than is required for ordinary use. The first-named process is by far the most economical and in every way as good. We have invested in this department of our business ten thousand dollars, and have kept an account of its cost, so that we are prepared to say what our peat has cost. Not reckoning anything for the depreciation of our meadows, which cost, on an average, seventy-five dollars per acre, we find as the result, that the peat, carted two and a half miles to our works, dried and prepared for the furnaces, has cost us on an average $3\frac{1}{2}$ cents per bushel as wages were before the war-prices commenced: since then 5 cents per bushel. We have been much disappointed in the value of the ashes. At first we sold them at about two cents per bushel; since the value of them has been tested for agricultural purposes, the farmers will not take them away as a gift.

WASHBURN & MOEN.

Worcester, Mass., Dec. 19, 1864.

New Plan for a Gas Engine.

MESSRS. EDITORS:—Will you inform me through your columns whether any use can be made of gas from water for heating purposes—not light? Will such gas give heat if passed through a coal fire, as in a furnace on steamers or in a house stove? There is no doubt that the thing can be accomplished, but in what manner? Also, whether or not petroleum and other oils and fatty matter can be used as motive power by placing the same in a boiler, thus making a gas—which we know will burn—and passing it to a place under the boiler, to burn it the same as coal? Coal placed in a boiler will give power as steam, and the gas thus made can be used to heat the boiler, thus saving great expense. PETROLEUM.

[Water is composed of hydrogen and oxygen, in the proportion of 1 pound of hydrogen to 8 of oxygen. If water, in the state of superheated steam, is brought in contact with red-hot charcoal, it is decomposed, the oxygen combining with the carbon of the coal, and the hydrogen being set free in the form of gas. Hydrogen, in burning, produces the most intense heat of any substance known, and it is in all respects the best fuel, being perfectly clean, and the product of combustion being pure water. But there is just as much heat directly absorbed or destroyed in decomposing the water as is afterward generated in burning the hydrogen, and there is, beside, a good deal of heat incidentally lost in the operation. There is, therefore, no economy of heat in decomposing water and then burning the hydrogen.

The suggestion in regard to working petroleum vapor through a cylinder, as steam is worked in a steam engine, and then burning the vapor, is novel and ingenious. If the price of petroleum should fall to about four cents per gallon it might be well to try this plan.—EDS.

Petroleum in Central New York.

MESSRS. EDITORS:—I have been spending some time in the central part of New York State and found there gas springs. The soil and the shale rock, and in fact, all the rocks in their neighborhood, are strongly impregnated with a benzine or petroleum odor. The gas will ignite on presentation of a lighted match. As your opinion may guide me in acting, I would ask, does this gas indicate beds of petroleum, or does it proceed from coal strata or beds of bitumen? J. L.

[These signs are certainly proof of the existence of petroleum in the locality, but they are no evidence of the existence of those caverns or cavities in the rocks which are essential to the accumulation of the oil in quantities sufficient to pay for boring.—EDS.

Holes in Glass.

MESSRS. EDITORS:—I saw, recently, in your "Notes and Queries," directions given for drilling glass. If you take an ordinary drill, well tempered, and instead of using oils, water, or camphene, wet it with coal oil or benzole, you will find it will cut glass about as rapidly as it would steel. I have drilled into the edge of a window-glass to the depth of one inch in fifteen to twenty minutes, frequently. If you wish to drill through the glass, it should be countersunk on both sides before the drill is started, as that prevents the drill from scaling the edges as it goes through. The best tool for countersinking is a drill dressed off at the point like a very flat three-sided pyramid. The same fluid will give a bite to a file that will make it cut very well for a while. J. J. B. HATFIELD.

Indianapolis, Ind., Jan. 26, 1865.

[The statement above has been frequently printed, but it does not apply generally, and we therefore print this correspondent's letter as a matter of public interest. Any anti-lubricating fluid aids the drill in penetrating, and turpentine, benzine, naphtha, have been successively used for the purpose. We have tried benzine on common lime or bottle glass, and find that a hole can be made with a common drill, but we have had no success with flint or plate-glass, and doubt if a hole can be made with a common drill in it.—EDS.

Glycerine for Gas Meters.

MESSRS. EDITORS:—The present high price of Alcohol and other spirituous liquors, which have till now been used for filling wet meters to prevent them from freezing up, has become the strongest inducement for gas companies, gas fitters, and consumers, to give glycerine a fair trial for their purpose. The prejudice and distrust generally prevailing are gradually giving way under the many proofs that glycerine is preferable to any other fluid as a non-freezing substance. Besides the cheapness of this article (being only about $\frac{1}{5}$ the price of alcohol), its other properties especially recommend it for the meters. As a neutral fluid it has no corroding effect on the metal of the meters, not being crystallizable, nor coagulating at a temperature near the freezing point of mercury, it will neither evaporate nor congeal at any temperature within these two extremes of the thermometer. Its non-freezing power decreasing in proportion to the quantity of water added to it; it can be easily adapted to the lowest temperature of any climate. A mixture, for instance, of two parts of glycerine and three parts of water will not freeze at twelve degrees below zero, Fah.; one pint to three pints of water not at twenty degrees below zero, and equal parts of glycerine and water will stand a temperature of six to seven degrees below zero. Glycerine reduced to this latter proportion is now extensively used by gas companies and gas fitters in the country and this city, where it has been introduced by Mr. Paul Balluff, of 95 Maiden Lane, the agent for Messrs. Hartmann & Laut, manufacturers of glycerine, in Cincinnati, whose advertisement appears in your paper.

It is generally sold in the concentrated state, and is left to the purchaser to dilute with an equal, or, if desired, with a less quantity of water.

G. P.

New York, January 31, 1865.

Pump Freezing.

MESSRS. EDITORS:—A very simple, practicable and economical expedient for preventing the freezing of pumps in exposed situations, consists in throwing in at the top of the pump each evening when there is reason to apprehend danger, a small quantity of brine, say a quart or less, and as it runs out at the spout catch and throw it back a few times so as to mix it with the surface water. In extremely cold weather plug the spout and fill straw in the handle-mortise, and you will effectually ward off an evil which incommodes many families in winter. Indeed, it is no uncommon thing for pumps in cisterns and wells in certain locations, to freeze so as to be of no further service until spring, or a general thaw restores them. A SUBSCRIBER.

1st month, 1865.

The Telegraph and the Weather.

The editor of the *Mechanics' Magazine*, in a summary of the news of the year, remarks:—"The electric telegraph is likely to render us henceforth a service which it has not until now been known to be capable of. For some time past it has been systematically employed, in this country at least, to transmit to one center meteorological observations made at a great number of widely scattered points, and to transmit from that center predictions founded on these observations; but Father Secchi, the famous Italian *savant*, now informs us that a line of telegraph wires itself constitutes a better indicator of certain kinds of meteorological changes than any other we as yet know of. All persons at all familiar with electric telegraphy are aware that currents other than those proceeding from the batteries employed are constantly passing along all lines of telegraph wires. They are derived from either the earth or the atmosphere, and are called 'earth-currents.' They are subject to great variations, which Father Secchi and some of his friends have for some time past been carefully studying, with the result, among others, of finding that, whenever the earth-currents are more irregular than ordinary, bad weather invariably follows, the degree of their regularity of the earth-currents bearing always an exact relation to that of the storminess of the weather which they precede. We are certainly progressing as regards our power of forecasting meteorological changes."

"Atlantic Monthly."

The *Atlantic Monthly* for February is a capital one. The House and Home Papers by Mrs. H. B. Stowe, which were so popular in the last volume, are continued in the current volume under a new title. "Dr. Johns" is the name of a new story just commenced, by Donald G. Mitchell, or Ik Marvel, as he is known to readers of the "Reveries of a Bachelor." "A Fortnight with the Sanitary," gives an interesting review of the aims, objects and obstacles it has to encounter, and several other miscellaneous papers on topics of general interest fill out the number.

The *Atlantic* has taken one step backward, however, in using antique type of a style long ago discarded as inelegant, obscure, and trying to the eyes. Modern type are far handsomer and clearer than those our grandfathers used, and the change from lively to severe is an improvement in the wrong direction.

MONTAIGNE, the celebrated French essayist, whose clear style, as well as vigor of thought, has been the praise of good critics the world over, made his boast that he never used a word that could not be readily understood by anybody in the Paris markets.

© 1865 SCIENTIFIC AMERICAN, INC.

AN AGRICULTURAL MUSEUM AT WASHINGTON.

The *National Intelligencer* enumerates some new objects of interest in the Agricultural Museum in the basement of the Patent Office, which were also brought to our notice during our recent visit to Washington.

Among these new objects were two clusters of raisins of extraordinary size, grown and cured in California. They were presented to the Land Office, by the Hon. J. Conness, United States Senator from California, and by the officers of that bureau deposited in the museum. The largest of these clusters has one hundred and seventy-five berries upon it, and the smallest one hundred and twenty. These are fit "companion pieces" for the mammoth "four-pound pear," also from that fertile region, and to be seen in the same Department.

Some very rich samples of sirup have been added to the sorghum shelf within a day or two past, the product of New Jersey soil and manufacture. This sorghum business is increasing in some sections to an extent of which the country at large is scarcely aware. It threatens to drive West India molasses out of the market altogether, and, indeed, has already done so in many portions of the Western States. A gentleman from southern Illinois stated in the Department a few days since that he alone had seven hundred barrels of the sirup for sale the past fall, and that it was fast becoming the universal sweetener of the entire West.

An addition has been made to the fiber collection of several fine specimens of flax contributed by Michael Fryer, Esq., of Wilmington, Delaware; and to the farmyard stock of a beautiful Cotswold lamb of eight months, with a fleece some ten or twelve inches in length; also, a pair of black Spanish fowls.

We notice, also, a curious sample of vegetable velvet, made of the common cat-tail flag, under a patent recently taken out by some gentlemen of this city. We understand that plush, furs, and velvets, of excellent quality and of various colors, can be made from the same material by the patentees' process of supplying a back-ground or skin of some india-rubber preparation.

It is gratifying to see the rapid increase of interest in this newly-established cabinet. The nucleus once formed draws contributions from all parts of the country; and what has been done within the past five months shows what a magnificent collection might have been secured had the museum been instituted from the commencement of the Department.

Mr. Glover's specimens of stuffed birds and fowls, also of artificial fruits, are objects of much interest to all who visit this Department. Mr. Glover has also collected a valuable amount of information concerning the insects and diseases that prey upon fruits, which ought, in some form, to be published for the benefit of the people. It is a subject worthy of the attention of Congress, and an appropriation ought to be made for the purchase of Mr. Glover's rare and valuable collections.

THE PNEUMATIC LOOM.

We recently mentioned the invention, by Mr. Harrison, of England, of a loom in which the shuttle is driven by a jet of compressed air in place of the pickers now in use. The last number of the *Mechanics' Magazine* contains the following description of this loom. The statement that $\frac{5}{13}$ of the whole power required to drive a loom is saved by this invention seems to be incredible, for we should not suppose that this proportion of the power is expended in driving the shuttle by the present method :—

"Each 'pick,' or 'stroke,' is produced by a jet of compressed air, which is discharged from the valves of the shuttle-box, upon the end of the shuttle, and drives it with great rapidity to the opposite box. In the power loom the average rate of speed is about 180 picks or strokes per minute, while in the pneumatic loom the speed is at least 240 strokes per minute. The new loom possesses many advantages over those in present use. A greatly increased productiveness is attained at a less expenditure of power. No accurate data has at present been obtained as to the power required for working the respective machines, but according to the inventor's returns the proportion in favor of the pneumatic over the ordinary loom is as 13 to 8. This is confirmed by actual experiment, for while it required nearly the whole power of a man to move the old machine, the new loom could be moved easily with one hand on the bar. The force required to overcome the tension of the spring attached to the shafts of the levers or arms in the loom, and the amount of resistance offered by the pickers as they traverse the spindle, is wholly avoided in the pneumatic loom. The shuttle is also much lighter and consequently easier to work. Another advantage is, that the work produced is of an improved quality. This is owing mainly to the flight of the shuttle being in a mathematically true line, and to its being uninfluenced by the propelling force from the lever arms. No vibration is imparted to the frame in the combing up of the weft, and every thread is laid perfectly even. It is said a saving of about 30s. is effected in the first cost of the loom as against the cost of those on the old system, and this includes the addition of all the parts necessary to give effect to the atmospheric system. But this, according to the inventor, is not all. The important item of wear and tear is subject also to considerable reduction. Mr. Thomas Page, C. E., has examined the new loom, and reports very favorably upon its merits. He estimates a saving of not less than £2 per loom per annum will result from the adoption of the pneumatic principle. The method of applying the compressed air is very simple, consisting of an air pump, which forces the air into a cylinder, whence it is conducted by pipes to each loom. A flexible pipe connects the tube in each loom with a service pipe under the floor, and with each revolution of a wheel, with a graduated cog, a small valve is raised which admits the air into the shuttle box at either end as required. The other working portions of the loom are in all respects similar to those of the ordinary one."

Petroleum as Fuel for Raising Steam.

Mr. C. J. Richardson, an Englishman, has been making several experiments with petroleum for fuel, and gives the result in an interesting letter to the London *Oil Trade Review*. We copy:—

The result of the experiments with my grate at Woolwich Dockyard has more than fully confirmed the value of the oil above coal for steam fuel, as first proved by my experiments at Chelsea. Several of the naval engineers who saw the grate said it was much too small to get up steam, its superficial contents being only two feet. It was placed in position under the boiler of a powerful steam hoisting engine of fourteen horse-power, capable of being worked up to 24 h. p.; the size of its coal grate was nine feet super. With the water cold at starting, and with a consumption of only five gallons of oil, in two and a half hours it caused the steam to blow off fully; one half-hour of the time the valve fixed at 10lb. pressure. The grate of thin cast-iron, in four separate pieces, was not sufficiently strong to bear the pressure, which was fully equal to 25lbs., and, as it indicated weakness, I drew off the oil, about one gallon, five having been supplied. If the coal grate had been reduced to two feet super, I question whether it would have done as much in eight or ten hours. I submitted to the engineer of the yard drawings for a wrought-iron grate, to be fixed to and make part of the boiler; and I have been requested by the Admiralty to send these drawings to Woolwich for estimates to be made, so that it should be tried on a large scale. The drawings I left there this morning.

It was in your paper that I first saw the report of Professor Fisher, of Newhaven, speaking so strongly as to the absurdity of petroleum competing against coal as steam fuel; other analytical chemists of equal eminence in England have followed suit. Immediately a notice appeared in the *Times* of the experiments at Woolwich came a letter, stating that "a very slender consideration of the character, composition, and cost of petroleum would be sufficient to show the impracticability of using it as fuel in such a case. The heating power of petroleum is certainly higher than that of coal=1·5 : 1·0. But the price of petroleum varies from 15*l*. to 20*l*. per ton. . . . Now, these facts will be sufficient to convince any one of the impracticability of using petroleum as a substitute for coal in steam vessels, quite independently of any contrivance as to the mode of burning." Almost the words of Professor Fisher. I received a letter from an eminent engineer (in the early stage of my experiments), whom I had asked to view the process, almost in the same strain; this gentleman I afterwards found was the owner of some valuable patents entirely dependent upon the use of coal as steam fuel. I can well imagine that when petroleum comes into use instead, it will cause some considerable jealous excitement. Coal mines and their monopolies are too valuable a property to let slip without a struggle. My answer to Professor Fisher, and all analytica chemists, is this: If coal could be fully utilized, their statements would be correct, but it cannot; through the present system of rapid firing one half the fuel goes off in heavy black smoke, owing to the impossibility of supplying sufficient air to effect the combustion of the gases the coal gives off when heated. By careful firing and the use of the Argand furnace, the entire prevention of smoke can be obtained, and the fuel be more fully utilized. But there is a prolific cause of waste, which is beyond the power of any Argand furnace or careful firing to cure. Coal can only be burnt by supplying it with a strong draught or current of air; it requires a tall chimney—the taller the better, because the quicker the draught. This current of air must be formed before the coal is put into the furnace; large logs of wood are fired, the furnace doors being kept open; when the coal is put in a welding heat is often obtained through the quickness of the draught. The office of the tubes and flues in the boiler is to obtain as much heat as possible from the passing current, going several hundred cubic feet per minute. When the current of heated air enters the chimney funnel it represents waste heat, and is never less than 600° F. In a late work by Mr. Wye Williams, no second authority on this subject, entitled, "On the Steam Generating Power of Marine and Locomotive Boilers," he details three careful experiments as to the best form of boiler to obtain the greatest amount of heat from the fuel. He gives the temperature of the waste heat to the first experiment (he calls them properly "the escaping products in the chimney,") as 1060°; to the second, 760°; and the third, 635°; and this, be it observed, with the consumption of only 3 cwt. of coal to each experiment. I should like Professor Fisher to give us the temperature of the waste heat in the chimney of a furnace burning from 20 to 30 tons of coal per day. We know the current is so strong that it often carries up small coal and cinders along with it; that the heated gases often take fire by a spark from the furnace, and burn at the top of the funnel with a fierceness almost equaling the flame from a blast furnace. Is this flame or waste heat employed in creating steam? and how much is the coal utilized? If we place the figures thus—petroleum=1·4, coal=0·4, it would very likely be too much in favor of the coal. We shall never fully learn the wicked waste we are now making of this valuable fuel until petroleum supersedes it, which it certainly will do within a few years.

Ship Canal around Niagara Falls.

On the 1st of February the U. S. House of Representatives passed a bill providing for the construction of a ship canal around Niagara Falls. As we go to press it has not yet passed the Senate.

FUEL.—An invention, by Mr. John Milnes, of Gloucester, England, consists in taking peat and mixing it with culm, slack, small coal, coal brash, or refuse of coal, which he prefers to be mixed in equal portions, and the same may, if required, be squeezed or pressed into compact masses or blocks, and will then be fit for use as fuel, and be much improved in quality. He can also mix peat with coal brash, and the earthy substance found with it, or with clay.

CORNISH PUMPING ENGINES.—The number of pumping engines reported for Nov. is 35. They have consumed 1928 tons of coal, and lifted 14·4 million tons of water 10 frames high. The average duty of the whole is, therefore, 50,300,000 lbs. lifted 1 ft. high, by the consumption of 112 lbs. of coal.

THE scientific world of Paris is much occupied by the experiment which M. Graof intends making in a few days of flying from the towers of Notre Dame by his new machine. He undertakes to remain suspended in the air with as much ease as a bird. Let him read the story of Icarus, and beware.

© 1865 SCIENTIFIC AMERICAN, INC.

Improved Coal Scuttle.

This coal scuttle is intended to effect the object for which such articles are intended, by discharging the coal through an aperture at the bottom, thus avoiding, says the inventor, the dust caused by pouring over the top. The scuttle is allowed to rest on the stove, and the bottom slide, A, withdrawn; the coal is then discharged through the bottom, as before mentioned. In Fig. 2 the oblique line, B, shows an inclined bottom, which conducts the coal to the aperture and allows all of it to be let down to the point of discharge. A set of legs or short knobs can be placed on the bottom to prevent the slide from being jammed when set on the floor or a base, C, as shown in Fig. 2. These scuttles can be made of any desired style and size, and for many purposes will be found useful. The invention was patented on the 13th of December, 1864, by George Chambers, of Ithaca, N. Y. The inventor will dispose of the patent, or enter into negotiation with parties to manufacture.

Fig. 1

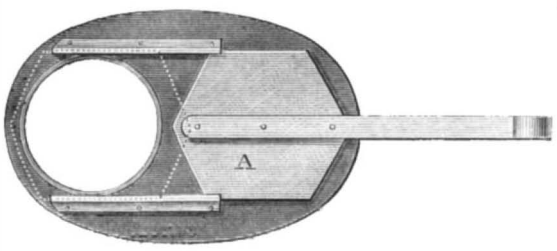
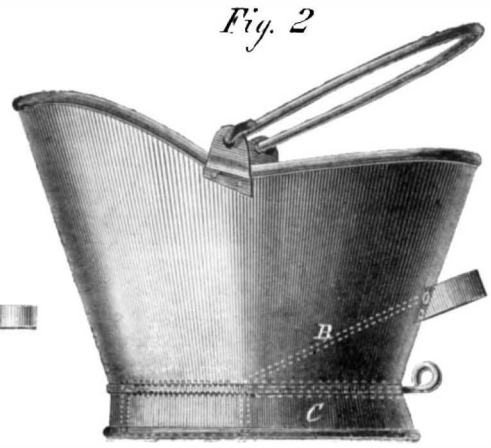


Fig. 2



CHAMBERS'S COAL SCUTTLE.

Sharpening Needles by Electricity.

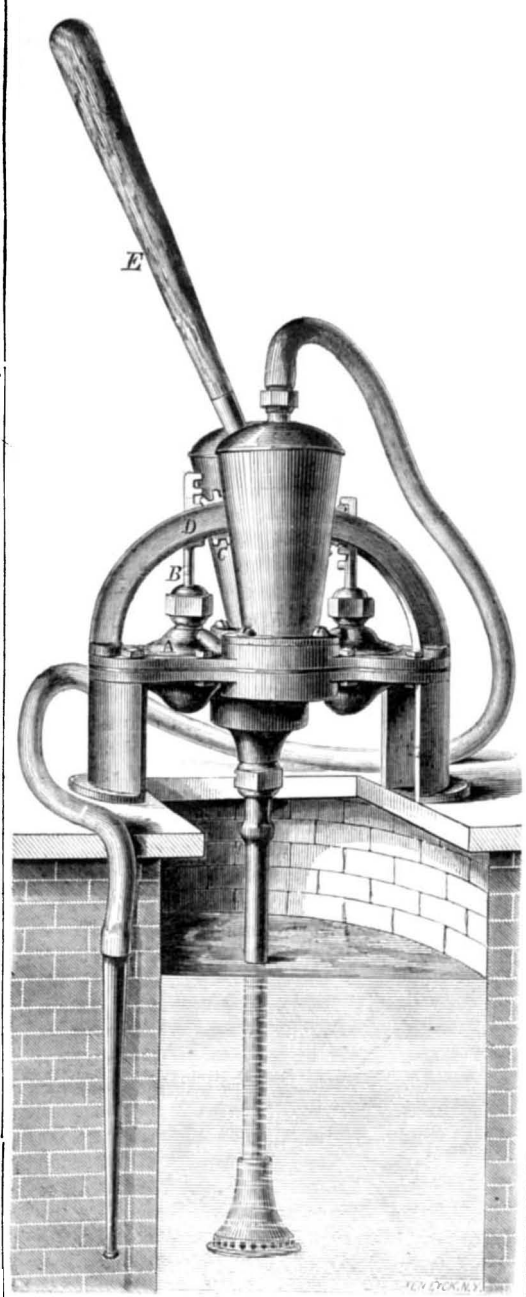
A practical application of electricity in an altogether new direction has just been made by a telegraphic engineer at Lausanne, and seems really to promise very valuable results. Mr. Cauderay, the gentleman in question, has found that the electric current is capable of performing readily and cheaply an operation which, as practised hitherto, has been one of the most unhealthy within the whole range of the industrial arts, namely, that of sharpening the points of pins and needles. He first observed that if a thin wire connected with the negative pole of a galvanic battery, and so forming a negative electrode, be passed through its bottom into a vessel containing water slightly acidulated, and another similar wire connected with the positive pole of the battery, and so forming a positive electrode, enter by the mouth of the vessel, and pass down into the acidulated liquid until its point is within the sixteenth of an inch or so of that of the negative wire, each wire being placed vertically, and the one exactly above the other, the circuit will be completed. Although the battery may consist only of a single cell, by the aid of the small quantity of acidulated liquid between the extremities of the two electrodes, a current will thus pass, and within a few minutes the lower extremity of the upper wire or positive electrode will have become perfectly conical, the fineness of the point of the cone depending on the thickness of the wire, the metal it is made of, and the particular acid used. Experiments suggested by this observation resulted in the discovery that precisely the same phenomenon would occur in the case of each, if, instead of a single wire, a bundle consisting of a great many wires were used as the positive electrode. The applicability of this discovery to the sharpening of pins and needles as a manufacturing process, seems to have been thoroughly tested, and we are told that the pointing of these implements by electric agency requires so little battery power when practised on the great scale, that it is materially cheaper than the old method of pointing them, while the points obtained are much more perfect than have ever been got by grinding. That tedious process, the fine metallic powder disengaged during which is so injurious to the workmen engaged in it, despite all the precautions they can take, would thus seem to be really doomed at last.—*Mechanics' Magazine.*

WHY FLANNELS BECOME DAMP.

An old housekeeper asks us why her flannels become damp while they are packed away in her drawers. In some cases it is doubtless owing simply to a change in the temperature of the air with which they are confined. Warm air will absorb and retain more moisture than cold air. Summer air contains a great deal more water than winter air of the same apparent dryness. If flannels are packed away in the summer, they are surrounded, and all their interstices are filled, with warm air; then if the air is cooled, it loses the power of holding the whole of the water which it contains, and a portion is deposited on the flannel. Prof. Henry found that a cubic foot of air if saturated with moisture at zero will hold half a grain of water, and at 100° will hold 19¾ grains.

ROWES'S DIAPHRAGM PUMP.

This pump is constructed on a novel principle. There are no buckets or pistons in it, and the necessary vacuum in the barrel is obtained by the alternate action of a diaphragm, confined between two plates. These diaphragms, for there are two, one in each chamber, A, are attached to the rod, B, said rod having a rack on the upper end which gears in a pinion, C, set in the guard, D. The pinion further gears in the lever, E. When the latter is worked back and forth motion is communicated to the diaphragms, so that the air above and below them is displaced and water flows in as the result. It is very simple in construction and not liable to get out of order. As there is no piston or packing to be renewed, it will continue to work a long time without repair; for domestic use or for watering gardens, pumping liquids in factories, and in all situations where machines of this class are employed this will be found useful.



The patent was issued through the Scientific American Patent Agency on the 8th of November, 1864. For further information address P. C. Rowe, patentee, 594 Washington street, Boston, Mass.

THE CRANK MOTION.

We have just had a long conversation with two inventors who called to consult us in relation to a device for preventing the great loss of power from the crank motion. As some other inventors may be interested in the problem, let us say once more, there is no loss of power in converting rectilinear into rotary motion by means of a crank

When the crank is at right angles to the connecting rod of a steam engine, it is plain that the power of the steam is exerted to turn the shaft with the full advantage of the crank acting as a lever, but when the engine is near the centers, with the crank nearly parallel to the connecting rod, the power of the steam seems to act mainly to draw the shaft from its bearings, and with very little tendency to make it turn on its axis. It is, therefore, not very strange that the idea should prevail to a considerable extent, that the engine operates at a great disadvantage, and with a corresponding waste of power, when the crank is nearly on the centers.

But when the crank is at right angles with the piston rod, a movement of the piston through one inch of stroke will move the crank only about one inch, while when the crank is nearly in line with the piston rod, a movement of the piston one inch will move the crank several inches. In this, as in other mechanical operations, what is lost in power is gained in time. With the proper diagrams it can be shown by geometric demonstration that a cubic foot of steam will do just as much work in one part of the stroke as in another.

This conclusion is subject to one qualification; the friction of a revolving shaft is in direct proportion to the pressure on its bearings. Very near the centers an inch motion of the crank is effected by a very small motion of the piston with a correspondingly small expenditure of steam and small exertion of force. In some cases the force is not sufficient to overcome the friction We once saw a ferry bridge smashed by the stoppage of the ferry-boat engine from this cause.

ARTIFICIAL FUEL.—An invention has been patented, through Mr. Brooman, by Mr. F. C. Armelin, which consists in combining petroleum oil waste, or raw petroleum oil, cow-dung, coal-dust, and water, to form artificial fuel, the proportions of the ingredients being varied according as the fuel is intended for domestic, industrial, or locomotive and marine purposes.

PERMITS have been granted, it is said, by the Government to certain parties to cut cypress and yellow pine lumber in the State of Georgia. There is a very great demand for these kinds of lumber in the country at this time.

© 1865 SCIENTIFIC AMERICAN, INC.

THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D, MUNN, S, H. WALES, A, E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York.

☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XII. NO. 7....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, FEBRUARY 11, 1865.

Contents:

(Illustrations are indicated by an asterisk.)

utomatic Stop-motion for Steam Engines..... 95
How to Detect Counterfeits... 96
Recent American Patents..... 97
Extracts from Helmholtz..... 98
*Merritt's Tree Protector..... 98
The Steam Machinery of the Navy..... 98
Interesting to Photographists.. 98
Condition of New York Machine Shops..... 99
A New Use for Castor Oil..... 99
Rules for Finding Gears to Cut Given Threads..... 99
A New Source of Iodine..... 99
"Atlantic Monthly"..... 100
Peat as a Fuel..... 100
New Plan for a Gas Engine... 100
Petroleum in Central New York..... 100
Holes in Glass..... 100
Glycerine for Gas Meters..... 100
Pump Freezing..... 100
The Telegraph and Weather... 100
An Agricultural Museum at Washington..... 100
The Pneumatic Loom..... 101
Petroleum as Fuel for Raising Steam..... 101
Ship Canal around Niagara Falls..... 101
*Chambers's Coal Scuttle..... 102
Sharpening Needles by Electricity..... 102
Why Flannels become Damp... 102
*Rowe's Diaphragm Pump..... 102
The Crank Motion..... 102
Balanced Slide Valves..... 103
The Patent Office..... 103
Lighting Paper at a Lamp..... 103
Special Notice..... 103
Patent Claims..... 104, 105, 106, 107
Notes and Queries..... 108
A Great Country for Americans..... 110
*Rogers's Rain Conductor..... 110
Distinguishing Features of the Cornish Engine..... 110

BALANCED SLIDE VALVES.

A serious objection to the use of slide valves is the great power absorbed in operating them. When this detail of the steam engine is of any considerable size the evil increases to an injurious extent, so that the force required to work the valve is a large per centage of the whole power of the engine. Indeed, it is not unusual to see slide valves which have an area closely approximate to the total number of square inches on the piston, and if the nature of the work to be done were similar in both cases, the pressure on the piston would be balanced by that on the valve, and the engine would not move.

The result of this great labor on one part of the engine is followed by the rapid wear of everything connected to or with it. The eccentric straps of screw propellers are often made of wrought iron and bushed heavily with brass, so as to withstand the strain and to avoid heating caused by the excessive friction. The rock shafts are made unusually heavy, the valve stems much stouter, the journals larger and longer, and in fact each detail is very greatly enlarged so that it may be capable of performing the task assigned to it. Thus a larger amount of material is used than is needful, an increase in the cost of construction is apparent, expense in lubricating and repairs ensue, and the whole system is not only defective from an engineering point of view, but vexatious in its commercial aspect.

Aside from this defect, the slide valve when properly made, is one of the simplest and most effective devices ever invented for its office. If there were no remedies for the disease spoken of previously, the adoption of the slide valve, beyond certain areas, would be discouraged, but since the ingenuity of man has provided a way of escape, it is singular that so few interested parties avail themselves of it.

If we were temporarily made a power from which there could be no appeal, we should immediately fulminate an edict against parties using slide valves, and command them, on pain of large annual repairs, and manifest deterioration of their property, to apply some method whereby the pressure of the slide valve would be reduced to a rational amount; no greater than that due to the work required of it.

When the first invention to relieve the excessive friction of the valves was brought out it was a step in the right direction, but the attempts to introduce this valuable improvement have met with very little encouragement from those most interested. In the cases of large screw propellers which have engines working at high speeds it is absolutely necessary to divide, or take off the pressure on the valve face. Different methods have been adopted to do this. One of the simplest for low pressure engines is that invented by Messrs. Penn, of England. This consists in planing the back and face of the valve parallel and placing a brass ring between the back and steam chest bonnet so that the junction is steam tight. This ring covers only a portion of the area of the back, and therefore excludes the steam pressure from that area. A connection is maintained with the space inside of the ring and the condenser, which materially aids in restoring the balance, or reducing the friction of the valve on its face.

A striking effect of the utility of this contrivance, so far as relieving the pressure is concerned, was witnessed by engineers on the Italian frigate *Re d'Italia*. The condenser communication was shut off when the valves, stems and rods, although of ample dimensions, trembled violently, showing that the resistance to motion was very great. On restoring the connection the valves resumed their previous easy movement.

Another method is to attach a steam cylinder to the steam chest In this cylinder there is a piston which the main valve is connected to by links; when the steam is let into the chest it presses equally on the valve and the piston, between the two so that the pressure is taken off the valve in the ratio of the difference between its superficies and that of the piston. The piston has a slight reciprocating movement to compensate for the stroke of the valve. Vacuum may be maintained on the back of the piston so that by the combined force of the steam and the absence of back pressure on the piston the valve may be actually pulled off its seat. It is impossible to detail all the ingenious and practical devices for this purpose but it is manifestly proper that they should be universally adopted.

THE PATENT OFFICE.

We have heretofore spoken of the prosperity which attends the present administration of the Patent Office. Some statistics which we have recently obtained will be of interest not only to inventors but to the nation.

During the period of 8 years, from 1853 to 1860, the number of applications examined was 39,417—being an annual average of 4,925.

During the same period were patented 23,363—an annual average of patents of 2,920.

During the last four years, 1861 to 1864, the applications examined were 22,687—an annual average of 5,672.

During these four years were patented 15,761—an annual average of patents of 3,938.

This exhibit is highly gratifying when we reflect that throughout this latter period a civil war has been in progress, which has thrust its bloody fingers into every hamlet and brought waste and expenditure into every household. It proves that the rebellion has not broken the prosperity of our country, nor shaken the confidence of artisans and men of science in our future career. These two classes furnish the greater part of these inventions which are of intrinsic value, and their belief in Liberty and Union has never faltered. Even from the army and navy they send the results of their genius and studies. It is creditable to the gentlemen of the examining corps of the Office, as it is also to its administrative head, that with greatly reduced numbers they have accomplished such a vast amount of work.

In 1861, Commissioner Holloway, fearing a deficit, reduced the corps from 31 Examiners to 23. This reduction is fully justified by events, for the revenues of the Office are largely in excess of its expenses, and show a large surplus; and the statistics show that two-thirds of the old force have examined an average of 750 cases a year more than the full force examined. Each Examiner must have passed upon 246 cases annually during the last four years, against 159 cases during the preceding eight years. Every inventor is personally and deeply interested in the prosperity and faithful administration of the Patent Office, and in the industry and integrity of its Examiners and employees. And this exhibit will renew their confidence in the gentlemen to whom their inventions are submitted for examination. For ourselves we are not given to dictating or even to suggesting what ought or ought not to be done in Patent Office matters, but from long acquaintance with its business and practice we are convinced that it would be well to increase the number of "Rooms," and give each Examiner and First-assistant Examiner a separate class. This plan was begun by Judge Mason, and has been since continued to some extent in order to keep the Office from being overwhelmed with unexamined cases, and we believe it is the only plan by which to avoid the numerical increase of the force. Congress has twice sanctioned this plan by directing the Commissioner to put those who acted as full Examiners upon the same footing as to salary while they so acted. [See Acts of Aug. 18, 1856, sec. 10, and June 25, 1860]. We hope that Congress will continue this authority to the Commissioner, and thus enable him for a while longer to keep up the work with his present economy of force.

LIGHTING PAPER AT A LAMP.

If the end of a piece of ordinary paper be inserted in the blaze of a candle it will take fire instantaneously, but if a similar piece of paper be passed down the chimney into the hotter blaze of a kerosene lamp it will not ignite. If a piece of light wood be thrown upon an anthracite fire in a grate at the back side next the chimney, it will smoulder away without any blaze, but if it be drawn forward to the front edge of the fire it will flash instantly into flame.

These facts would have been unfathomable mysteries to the ancient authors of classic literature who believed that fire was one of the four elements, but they are very simple to the modern school-boy, who knows that combustion is the chemical combination of two substances. As the burning of paper is the act of combining its carbon and hydrogen with oxygen, the presence of oxygen is just as essential to combustion as the presence of the paper.

Oxygen, forming one-fifth of the volume of atmospheric air, and being mingled in it mechanically, is met with in a free state wherever the atmosphere exists. Cold oxygen might lie by the side of cold paper forever without any combination taking place, but if they are heated to about 1000° they immediately enter into combination. In lighting paper, the office of the blaze is to heat the paper to the temperature at which it will combine with oxygen, and if this is done in the atmosphere where the oxygen is always present, the elements enter into that rapid combination which is combustion.

The air in the interior of a lamp chimney has been deprived of its oxygen by burning the oil. If a careful analysis were made of this air it would be found to consist of nitrogen, steam, and carbonic acid; the nitrogen being left from the air after the oxygen is consumed, the steam being formed by the combination of oxygen with the hydrogen of the oil, and the carbonic acid by the combination of oxygen with the carbon of the oil.

The wood on the back side of a grate fire is decomposed by the action of heat, its hydrogen being driven off as a gas, and floating up the chimney, but this hydrogen does not burn because the air that rises through the fire has been deprived of its oxygen in burning the coal. But if the stick be drawn to the front edge of the grate, the hydrogen as it escapes encounters the free oxygen of the atmosphere, and will flash into flame.

SPECIAL NOTICE.

IRA L. CADY, of New York City, has petitioned for the extension of a patent granted to him on April 29, 1851, for an improvement in compound metallic door for vaults, safes, etc.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, April 10, 1865, at 12 o'clock, M., and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

A GENERAL movement is said to be on foot among the Western Railroad Managers, in view of the increased cost of fuel in particular, and of construction, repairs, and other expenses in general, to reduce the speed of passenger trains to a maximum of twenty miles per hour.

© 1865 SCIENTIFIC AMERICAN, INC.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING JANUARY 31, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

46,061.—Mode of Economizing the Manufacture of Articles of Leather.—William Adamson, Philadelphia, Pa. Ante-dated Dec. 29, 1864:

I claim cutting from raw or untanned hides or skins, or parts of the same pieces, of the size or about the size and form required for useful articles of tanned leather, and tanning the said pieces after they have been thus cut from the raw or untanned hides, as and for the purpose herein set forth

46,062.—Process for Making Looking Glass.—Louis Paul Angenard, New York City:

I claim the chemical proportions and preparation of the solution and its application to plate glass and other kinds of glass.

46,063.—Manufacture of Argand Burners.—Ellis S. Archer, New York City:

I claim the making of an Argand burner, in the manner described, thus dispensing with the tip or perforated ring, as heretofore made.

46,064.—Sewing Machines.—Joseph W. Bartlett, New York City:

First, I claim the combined sliding and rocking movement of the looper, or under needle rod, or shaft, i, when arranged and actuated, substantially as set forth.

Second, I claim the adjustable sleeve or lever, o, when constructed and operated as and for the purposes set forth.

Third, I claim the sliding and rocking looper, or under needle rod or shaft, i, the adjustable sleeve or lever, o, the cam or lever, u, and pin or projection, z, when combined substantially as set forth.

Fourth, I claim the sliding and rocking looper or under needle rod or shaft, i, the cam or lever, u, pin or projection, z, and feed bar, s, when combined substantially as set forth.

Fifth, I claim the presser foot, e, cam, x, (as shown and described in Fig. 7, sheet 2,) and sliding and rocking rod or shaft, i, when combined substantially as set forth.

46,065.—Machine for Surface-sizing, Wadding, Etc.—Samuel Baxendale. of South Malden, Mass.:

I claim, first, The combination of the rotary cylinder, F, having pin points or other rigid projections on its periphery, with the rotary brush, D, or its equivalent, from which the pins or projections of the said cylinder receive the sizing, to sprinkle it upon the bat or web by centrifugal force, substantially as herein specified.

Second, The deflector, I, in combination with the cylinder, F, substantially as and for the purpose herein described.

Third, The reticulated or perforated metallic endless aprons, E E', in combination with a device for sprinkling the sizing upon the bat or web, substantially as and for the purpose herein set forth.

Fourth, The employment, in combination with two perforated or reticulated endless metallic aprons, E E, operating together, as herein described, of a blast pipe, M, or other equivalent device for delivering a blast of air, applied within one of said aprons, substantially as and for the purpose herein set forth.

46,066.—Instrument for Cutting Photographs.—Theodore Bergner, Philadelphia, Pa.:

I claim the described instrument for cutting out photographs, when its punch, A, die, B, and guide plate, C, operated as set forth, and are relatively so arranged as to facilitate accurate adjustment of the picture to be cut out, substantially as specified.

I also claim, in combination with the described instrument, the use of gages, b and o, substantially as and for the purpose specified.

46,067.—Centrifugal Ventilator.—Alpheus P. Blake, Milton, Mass.:

I claim, first, The arrangement of the fans or blowers of the exhaust wheel.

Second, Encasing the fans or blowers at the top and bottom.

Third, The combination and arrangement of the fans, disk and wheel, as shown in section in No. 2, all of which substantially as described and for the purpose set forth.

46,068.—Stave Machines.—Isaac W. Bowers, Ovid Centre, Mich.:

I claim the combination of the saws, H H, and springs, M M, applied to a stave-cutting machine, to operate in the manner substantially as and for the purpose herein set forth.

[This invention consists in combining two circular saws and two springs with a stave-cutting machine. The object of this invention is to saw the ends of the staves with the cutting operation, so that they will be all of the same length, thereby avoiding the necessity of sawing the staves after they are cut, in order to render them of equal length.

46,069.—Apparatus for Evaporating Saccharine Liquids.—Barclay Brown, Byberry, Pa.:

I claim, first, A grate made in sections, which can be moved both in a horizontal and in a vertical direction, substantially as and for the purpose described.

Second, The hook frames, D D' D'', and levers, E E' E'', arranged with sectional grates C C' C'', and handles, F F' F'', or their equivalents, in the manner and for the purpose substantially as set forth.

46,070.—Portable Gravitating Coal Sifter.—Wm. E. Brown, Boston, Mass.:

I claim the combination with a series of inclined sieves or screws of one or more deflectors, composed of inclined surfaces throwing the ashes out of the path of the sifted coal into the ash box, substantially as herein described.

46,071.—Adhesive Fastening for Papers.—George R. Burdon, Waltham, Mass.:

I claim locking or joining together loose sheets or pieces of paper by means of a hinged binding, composed of pieces of leather or cloth, united by means of a pin, or locked into each other, as set forth.

46,072.—Newspaper File.—Wm. Burnet, Providence, R. I.:

I claim the single rod, with a longitudinal groove or recess to receive the back of the folded sheets—the cord or wire shutting into the groove, and attached at one end to the spiral spring contained in the handle, and the other attached to the conical-shaped knot fitting the counter sink in the top of the rod, all made and operating substantially as set forth, or their mechanical equivalents.

46,073.—Pumps.—John H. Burns, Clinton Station, N. J.:

I claim, first, The barrels, A A', arranged at angles as described, in combination with the vertical crank shaft, E, and common ascension pipe, J, constructed and operated as and for the purpose herein shown and described.

Second, The spherical plungers, B, in combination with the barrels, A A', of a pump, and with the crank shaft, E, and operating substantially as and for the purpose set forth.

[This invention relates to an improvement in double-acting pumps, with two barrels placed in an oblique or angular position, and having their plungers connected to a vertical crank shaft, in combination with a common ascension pipe, in such a manner that by imparting to said crank shaft a rotary motion, both plungers will assume a reciprocating motion in opposite directions, and a continuous stream of water be forced through the ascension pipe. The plungers are made spherical to enable them to accommodate themselves to the varying position of the crank.]

46,074.—Construction of Gunboats.—Stephen Decatur Carpenter, Madison, Wis.:

I claim the manner of constructing the portion of gunboats or war vessels exposed to shot, shell or other projectiles, with outward projecting angles for the sides and ends, in combination with the level deck, substantially as herein described and for the purposes set forth in the specification.

46,075.—Painting Pails.—Jonathan Carter, Winchendon, Mass.:

I claim the conical die roll, when constructed in the manner and for the purposes substantially as set forth and described.

46,076.—Hand Stamp for Printing.—D. H. Chamberlain, West Roxbury, Mass.:

I claim bifurcating the outer end of the lever, C, so as to admit of the type block, E, being readily removed and replaced, in the manner substantially as set forth.

46,077.—Valve Cocks.—William Chesley, Cincinnati, Ohio:

I claim so constructing the boss, G, and the hub, H I, as to liberate the valve screw stem for regrinding, by simply screwing back said hub, which thereby becomes a fixed guide for the smooth portion of said stem, substantially as set forth.

46,078.—Machine for Washing Wool.—James A. Clarke, New York City:

I claim the combination of the apparatus described, for conveying the wool, etc., through the reservoir, with the apparatus for washing the same, consisting of the stamps, constructed as described, acting on a roller bed or its equivalent, as and for the purposes herein set forth.

46,079.—Filters.—Chas. Cleminshaw, Troy, N. Y.:

I claim the combination of the packing ring, c, with the close vessel, A, filtering medium, B, pipe, C, screw, b, and perforations, a a, arranged and operating as and for the purposes specified.

[This invention consists in forcing the liquid through the filt ring medium by means of a pump or other power, whereby the work is not only done more expeditiously than formerly, but a great economy effected in the saving of the filtering material, as all parts of the latter are rendered available in consequence of the power applied to the latter to force it through.]

46,080.—Valve for Submarine Ordnance.—John F. Cleu, New York City:

First, I claim the plug, B, provided with one or more valves, C C', and a cap, E, for the purpose of protecting said valves and excluding air from an exhausted cannon.

Second, I further claim the check valve, C2, employed substantially as described, to protect the aperture, b, and valves, C C', from the expansive pressure of the gases within the gun.

[The object of this invention is to provide means whereby the air contained in a submarine gun, between the charge and muzzle, may be drawn out and the gun kept in an exhausted condition, in order that the projectile may not meet with atmospheric resistance, and obtain greater range and penetrative effect.]

46,081.—Beverage.—Alexander Cochard, Port Richmond, N. Y.:

I claim the beverage prepared of the ingredients and in the manner specified.

46,082.—Combs.—G. F. J. Colburn, of Newark, N. J.:

First, I claim the combination of a movable metallic back with a comb, substantially as described, so that the comb can be readily taken out and replaced without injury to the said back.

Second, The use of a socket in one end of the metal back of a comb, in combination with a lip projecting from the end of the same, and with a clamp screw or other suitable fastening at the opposite end, substantially as and for the purpose specified.

Third, The combination of the metallic back of a comb, with a handle or case of similar material, and fitting the same together, substantially as and for the purpose described.

Fourth, So constructing a comb that the comb part proper and the back may be readily detached, substantially as described.

[This patent is additional to the one issued to the same party on the 17th inst., which we noticed at the time. We understand that Messrs. Howard, Sanger & Co., Nos. 105 and 107 Chambers street, New York City, are now manufacturing the combs.]

46,083.—Combined Roller and Corn Planter.—Peter Conrad, of Dorchester, Ill.:

I claim the bar, R, provided with the horizontal wheel, S, and arranged substantially as shown, in combination with the roller, B, for the purpose herein set forth.

I further claim, in combination with the bar, R, wheel, S, and roller, B, a corn-planting device, substantially as set forth.

[This invention has for its object the combining of a roller with a corn-planting device, in such a manner that the two devices will operate together much more perfectly than hitherto.]

46,084.—Hot-air Engines.—Moses G. Crane, of Chelsea, Mass.:

I claim, in hot-air engines, the arrangement of the main cylinder, the air pump, the furnace, the air passages and exhaust valve, so that the air pump piston shall work with equal pressure on each side thereof, substantially as set forth.

Also the employment of the valve, o, in the pump piston, in connection with the regulator valve in the passage between the pump and furnace, when arranged to operate substantially as specified.

Also so operating the pump piston in the stroke which supplies the main cylinder that said piston completes its said stroke before the main cylinder piston completes the stroke which is consequent upon said supply.

46,085.—Tub for Washing and other purposes.—John Danner, Canton, Ohio:

I claim, in combination with a washing tub composed of staves of wood, a metallic bottom, constructed and united thereto, in the manner substantially and for the purposes described.

46,086.—Stump Extractors.—Samuel Derr, Lockhaven, Pa.:

I claim the arrangement of the legs, B B B B, under the frame, A, so that they may occupy more or less breadth of space, substantially as and for the purposes herein specified.

I also claim in combination with the above the arrangement of the cross braces, M M M M, and tension rods, P P, so as to adapt them to the variations in the position of the legs, B B B B, substantially as herein set forth.

46,087.—Horseshoes.—William Disbrow, San Francisco, Cal.:

I claim a horseshoe composed of the parts, A A and G, the former being connected by a hinge, B, at their front ends, and provided with the pieces, D D, and heel plates, E E, the latter having oblique plates, F F, which enter notches or grooves made in the sides of the hoof, and the part, G, secured to the parts, A A, by screws, the whole being constructed, combined and arranged, either with or without the leather or other material, K, substantially as and for the purpose herein shown and described.

[This invention relates to a new and improved horseshoe, by which the latter may be secured to the hoof or foot without the aid of nails, and which will admit of being applied to and detached from the hoof or foot with the greatest facility.]

46,088.—Retorts for Distilling Petroleum.—Geo. H. S. Duffus, New Orleans, La.:

I claim in stills for rectifying petroleum and other oils, or producing illuminating or other oils or gases from any substances capable of treatment by heat, making the bottom of the retort with a dome or its equivalent rising therefrom up within its interior, substantially as described.

46,089.—Retorts for Distilling Petroleum.—Geo. H. S. Duffus New Orleans, La.:

First, I claim in stills for rectifying petroleum, or in which oils, coal or other substances are treated by heat, arranging the furnace or burner by which the heat is communicated or created, so that it and the flames or incandescent fuel can be moved near to and further away from the retort, according to the condition of the work, substantially as described.

Second, The burner or furnace, I, constructed substantially as described.

Third, The combination of the pervious cones with the gas pipe, h, and the perforated plates, i and j, or their equivalents, substantially as described.

46,090.—Retorts for Distilling Petroleum.—Geo. H. S Duffus, New Orleans, La.:

I claim, first, In stills for rectifying petroleum and other oils or producing illuminating or other oils or gases from any substances capable of treatmen by heat, covering the still with a jacket, inclosing or composed of non-conducting materials, substantially as described.

Second, The use in stills for rectifying petroleum and other oils, or for producing illuminating or other oils or gases from any substances capable of treatment by heat of steam, for the purpose of cleaning the retort substantially as described.

46,091.—Crib and Cradle.—Henry W. Eastman, Baltimore, Md.:

I claim the combination and arrangement of the hinged sides, N N, rockers, M M, bolts and thumb nuts, L, hooks, K, and metallic frame, O, all constructed and arranged substantially as and for the purpose set forth and described.

46,092.—Obtaining Spirits of Turpentine, Oil, Rosin and other products from Pine Wood.—A. H. Emery, New York City:

I claim, first, Passing a current of ordinary steam over and through the wood into a condenser in the manufacture of spirits of turpentine, rosin, etc., from pine wood,

Second, I claim in the manufacture of turpentine, rosin, etc., directly from pine wood, subjecting the steam, either ordinary or superheated, to a pressure while it is in retort, and passing therefrom into a condenser.

46,093.—Eaves Troughs.—Felix J. Emery, Springfield, Ill.:

I claim the eaves trough above described as a new article of manufacture.

[This invention consists in a new construction of eave troughs, in which cross braces are dispensed with, and the contour of the trough is preserved by means of its own strength and the stiffness of its connecting joints.]

46,094.—Street-sweeping Machine.—Samuel Emleu, Philadelphia, Pa.:

I claim, first, The vibrating brush, having a rising and falling motion, as hereinbefore set forth.

Second, The mode of driving the said brush by means of the pinions and ratchets upon the crank shaft.

Third, Jarring the brush at the extremes of its vibrations, as herein set forth and described.

Fourth, So proportioning the gearing of the machine to the diameter of the wheels and length of the brush that the same surface shall be repeatedly swept, substantially in the manner herein set forth and described.

Fifth, Combining the aprons upon the flanks of the machine with a vibrating brush, having lifting and jarring motions, as described.

Sixth, Attaching the brush to the vibrating beam or arm by means of springs, in the mode and with the effect described.

Seventh, The device for lifting the brush from the street pavement by the hand of the attendant without stopping the motion of the machine when said brush is vibrated and operated substantially in the manner hereinbefore set forth and described.

46,095.—Canteen Plates, Cup and Funnel.—Charles O Farciot, Philadelphia, Pa.:

I claim, first, The combination of the valve, E, with the canteen, G, when constructed in the manner hereinbefore specified and shown in the drawings hereto annexed.

Second, Combining with the canteen, G, the plates, H and H', so as to form cavities for containing provisions between the said plates and canteen body, the funnel, A, and bag or cover, B, in the manner and for the purposes hereinbefore set forth and specified.

46,096.—Neck-tie Holders.—J. Albert Eshleman, Philadelphia, Pa.:

I claim the plate or holder, A, arranged for the reception and removal of a ribbon or tie passing around the central part of the plate, and between it and the spring, and for confinement to the collar, all as set forth.

46,097.—Manufacture of Boxes.—Fred. W. Fliedner, New York City:

I claim the use in the manufacture of boxes of sheets of wood prepared substantially as described, as substitute for the sheets of paste board now used in the manufacture of paper boxes.

46,098.—Coffer Dam.—Arthur Folsom, New York City:

I claim the coffer dam, constructed and operated substantially in the manner described.

46,099.—Apparatus for Cutting Photographs.—L. A. Fowlley, Boston, Mass.:

I claim the apparatus herein described for cutting photographic pictures, passe partout frames, etc., arranged and operating substantially as described.

46,100.—Safety Guard for Hammer of Fire-arm.—H. E. Gibbon, Brooklyn, N. Y.:

I claim, first, The combination with the hammer of a gun of a toothed rack and spring detent for holding the hammer locked in certain positions, substantially as above described.

Second, I also claim setting the detent for engagement with the rack, and also throwing it beyond the path of the rack, by means of the same dog, d, substantially as above described.

[The object of this invention is to prevent the accidental discharge of a gun from careless handling, or from unavoidable contact with other objects, and it consists in a device which locks the hammer in every position except that of full cock, and which is alternately set and unset by the cocking and striking of the hammer.]

46,101.—Mounting Hand Mortars.—Wm. F. Goodwin, New York City:

I claim, first, Constructing a mortar with a hollow sleeve projecting from its base instead of trunnions or cheeks, substantially as above described, for the purpose of receiving the elastic cushion or any equivalent spring, and the end of a stake, as above set forth.

Second, I also claim the combination of the slot, E, and pin, D, with the aforesaid mortar, A, sleeve, B, and spring, C, as and for the purposes specified.

46,102.—Dead-center Lift.—Jas. J. Gorman, Cincinnati, Ohio:

I claim, first, The reciprocating rod, G, with tappets, b b, working beam, F, and pitman, E, in combination with the pitman, C, and crank, D, constructed and operating substantially as and for the purpose set forth.

Second, Making the rod, G, reversible, and combining it with working beams, F F', pitman, E E', and crank, D, substantially as and for the purpose described.

Third, The expansion bearers, d d, applied in combination with the spring, J, pitman, E, and crank, D, substantially in the manner and for the purpose specified.

[An engraving and description of this invention is published in the SCIENTIFIC AMERICAN, page 31, vol. XII.]

46,103.—Apparatus for Rendering Lard, Tallow, Etc.—C. E. Gray, New York City:

I claim, first, Making a close water jacket in combination with the tank and a part of it, and arranging said water jacket so made a part

© 1865 SCIENTIFIC AMERICAN, INC.

of said tank in direct communication with the furnace, so that the water jacket shall intervene between the fire and the tank and act as a means of conducting and distributing the heat from the fire to and around the fat.

Second, Using the steam generated in a close tank from the constitutional water in the fat, for the purpose of aiding and controlling the escape of the noxious gases and vapors, either to a super heater for consumption in the furnace or to a deodorizer for the purpose of deodorizing them, or to a condenser for the purpose of condensing them, in the manner substantially as described for the purpose specified.

46,104.—Machinery for Oiling Wool in Carding Machines.—George Shaw Harwood, Boston, Mass.:

I claim, first, The means and manner herein described of oiling wool whilst being fed to carding or other wool preparing machine by direct application of the oil or lubricating mixture on to either or both feed rollers substantially as set forth.

Second, In combination with carding engines or other wool preparing machinery of otherwise ordinary or suitable construction, I claim a covered oil tank or cistern for supplying either or both feed rollers of said machinery with oil, whether the same is effected directly by dripping the oil upon the roll or through the intermediary of a brush, roller, or band, or the mechanical equivalent thereof.

Third, In an oiling apparatus constructed for use as an attachment to carding or other wool preparing machine and in which the oil is distributed to either or both of its feed rolls, I claim the combination of an oil tank with a dipper arranged for operation substantially as set forth so that the oil or lubricating mixture shall be thoroughly mixed and conveyed to the feed rolls directly or through the intermediary of a brush, cylinder, or apron, substantially as described.

Fourth, I claim the employment of a roller or rollers made of any of the vulcanizable gums in combination with a dipper and pressure roller.

Fifth, In combination with a dipper and pressure roller, I claim two or more rollers revolving both upon their own axes and upon an axis common to them, substantially as herein described.

Sixth, I claim the apparatus herein described for oiling wool on the card, the same consisting of a tank extending transversely the whole width of the feed rolls of a rotary dipper and a revolving distributor when arranged to operate as described so as to agitate and convey the oil from the tank directly to the feed roller or rollers.

46,105.—Orchard Ladder.—Casson Hayes, Madison, Wis.:

I claim, first, The back brace, B, constructed with a single bearing point, substantially as shown.

Second, I claim the adjustible side braces, C, C, in combination with the brace, B, as and for the purpose set forth.

Third, I claim securing the side braces, C, C, by means of the the hooks, D, and buttons, d, as shown and described.

46,106.—Scroll Sawing Machine.—Antoine August Hoffman, New York City.

I claim the application to scroll saw frames of the adjustable centres of motion constructed with pins or points and conical sockets and retaining guards combined substantially in the manner described.

And I also claim the application of the device by which the saw may be turned, consisting of a cylindrical pin with a spherical head, combined with a socket made in halves and held by a jam nut and set screw, substantially as described, for the purpose specified.

46,107.—Hot Air Furnace.—Birdsill Holly, Lockport, N. Y.:

I claim the combination and arrangement of the radiating cylinder, A, or equivalent, fire pot, B, sliding plate, G, flue opening, f, and bar, h, substantially as and for the purposes herein specified.

46,108.—Threshing Machines.—Orsamus Holmes, New Lenox, Ill.:

I claim the giving of a longitudinal shake and tossing motion to the straw carrier, D, by a pitman, b, and crank, a, also the connecting of the grain screen, G, to the carrier, D, through the medium of the levers, E, E, arranged as shown, in combination with the straw shoe, F, attached to the rear of the screen, G, and provided with wires or rods e, e', substantially as and for the purpose herein set forth.

[This invention relates to a new and improved sliding or agitating device to be applied to grain threshing machines for the purpose of separating the loose grain from the straw, and enabling the grain and straw to be discharged separately from the machine.]

46,109.—Safe guard for Protecting Pottery Ware.—Benj. Jackson, Trenton, N. J.:

I claim a safeguard or "saggar" to receive articles of pottery ware while being burned or baked, composed of a series of rings or frames of fire clay so constructed or arranged that they may be fitted one over the other and receive pins to support the articles fitted within substantially as described.

46,110-—Windlass.—Peter H. Jackson, New York City, and Samuel Eddy, Brooklyn, N. Y.:

We claim [a chain wheel or windlass, formed with radial ribs that are movable, substantially as specified.

We also claim forming the annular space around a chain wheel with offsets, C, C, to better adapt the same to different sizes of chain as specified.

46,111.—Steam Engine Governor.—Oliver A. Kelly and Estus Lamb, Slatersville, R. I.:

We claim, first, The employment or use of a screw rod, b, screwing in the end of an arm, c, which extends from the rock shaft or valve spindle, d, and applied in combination with the governor and with suitable gear, substantially as and for the purpose set forth.

Second, The escapement wheel, k, and pawls, m, m', applied in combination with suitable bevel gear, e, f, screw rod, b, and with the governor and valve gear, substantially as and for the purpose described.

Third, The shoe, r, and cam slot, b', arranged in combination with each other and with the pawls, m, m', escapement wheel, k, screw rod, b, and with the governor and valve gear, substantially as and for the purpose specified.

Fourth, Making the shoe, r, in two parts which are hinged together, substantially as and for the purpose set forth.

Fifth, The tail, d*, applied to the hinged shoe, r, and operating in combination with the bar, c*, secured to the rock shaft, d, substantially as and for the purpose described.

[An engraving and description of this invention was published in the SCIENTIFIC AMERICAN, p. 344, Vol. XI.

46,112.—Gate.—Robert Kelly, Tuscola, Ill.:

I claim a gate constructed of uprights and slats and provided with an oblique or diagonal brace, one or more, a perforated slide and a pin or pins, all arranged substantially as and for the purpose herein set forth.

[This invention relates to a new and useful improvement in the construction of gates, those of large size, for vehicles to pass through. Gates of this size are quite liable to sag, owing to their length, and they soon drag upon the ground, so that the opening and closing of them is attended with considerable difficulty. This invention obviates this difficulty.

46,113.—Sawing and Boring Machine.—B. Klahr, Bernville, Pa.:

I claim, first, The combination of the parts by which the post is secured in position and moved to the tool, consisting of the carriage, C, the yoke, b, and clamping screw, a, with the stapled lever, c, acting in connection with the pins, d, d*, and stop, e, substantially as described.

Second, The movable bracket, J, and forked rest, i, in combination with the pin, j, carriage, C, and saw, I, constructed and operating substantially as and for the purpose set forth.

Third, The oscillating frame, r, in combination with the saw, I, carriage, C, and frame, A, constructed and operating substantially as and for the purpose described.

[This invention consists, first, in the arrangement of an open carriage provided with gage pins and applied in combination with a suitable hand lever, stop, and bore spindle, in such a manner that the holes in the post can be properly distanced, and by running the borer up three times at suitable points the desired mortise is produced; the post is held in position during the operation of boring by a yoke fastened in the proper position on the table or carriage and the holes are bored from below, so that the post can be readily centered.]

46,114.—Lantern Frames.—Robt. S. Laird, Sandwich, Ill.:

I claim the wire guards, A, attached at their lower ends to semicircular bars, E, E, which are connected to the base, B, of the lantern by hinges or joints, a, and attached at their upper ends to semicircular bars, F, F, which are secured to the top, C, by catches, G, G, substantially as and for the purpose specified.

46,115.—Machine for Making Lace Paper.—Charles Lang, Worcester, Mass.:

I claim removing the elevated parts of embossed paper by means of an apparatus, the principal parts of which consist of two rollers, substantially in the manner and for the purpose described.

46,116.—Cultivator.—Christopher Lidreu, Aurora, Ill.:

I claim the rising and falling bar, E, operated by the levers L, L', and having the plow standards, I, I, permanently attached to it as shown; in combination with the adjustable plow standards, F, F, attached to said bar as described, and operated by the crank shafts, k, all arranged substantially as and for the purpose set forth.

46,117.—Tubular Condensers.—William A. Lighthall, New York City:

I claim, first, The combination of the exhausting fans, J', J'', (or their equivalent) with the tubes, C, and division plates, a, a', a'', a''', a'''', as and for the purpose set forth.

Second, The combination of the exhausting fans, J', J'', (or their equivalent) with the tube, C, and reservoir, M, as and for the purpose set forth.

46,118.—Tire Shrinking Machine.—John A. Lloyd, St. Paul, Minn.:

I claim, first, Constructing the lugs, B, B, with horizontal and vertical key seats, so that the article to be secured may be pinched either upon its horizontal or verticle surfaces at pleasure.

Second, In combination with the bed plate, A, of a machine for shortening tires; the lever, D, lugs, B, B, and keys, C, C, substantially as described and for the purpose set forth.

46,119.—Spring Bed Bottom.—George E. Lord, Utica, N. Y.:

I claim the combination and arrangement of the spring, C, with the slat, B, the disk headed pin, D, the cap, E, substantially as and for the purpose set forth.

46,120.—Doffing Apparatus for Carding Engines.—Rushton Lord and Levi Hutton, Rittenhouse, Pa.:

I claim the carded cylinder, B, carded rollers, C, and plain stripping or clearing roller, B, when combined with a carding engine and arranged and operating as and for the purpose herein set forth.

46,121.—Folding Chair or Table.—Ferdinand Ludke, New York City.:

I claim first, The vertically sliding staff, A, with hub, B, and radiating arms, C, in combination with a sleeve, F, braces, E, hinged levers, G, and toggle arms, H, all constructed and operating substantially as and for the purpose set forth.

Second, The combination of the radiating arms, C, and braces, E, with a piece, D, of flexible material, and with legs, G, substantially as and for the purpose described.

Third, The toggle arms, H, in combination with the folding legs, G, and central staff, A, applied and operating substantially as and for the purpose specified.

46,122.—Air Pump.—Azel S. Lyman, New York City.:

I claim, first, An oscillating air or vacuum pump whose valve is operated by a positive movement derived from its vibrating motions, and independent of the piston, substantially as above described.

Second, I also claim constructing and operating the valve and its stem of a vacuum pump, substantially as above described.

Third, I also claim the combination of the inclined plane, J, with the valve and valve stem of an oscillating vacuum pump, substantially as and for the purpose above described.

Fourth, I also claim packing the joint around the valve stem by means of the elastic ring, r, and the packing ring, h, substantially as above described.

Fifth, I also claim packing the joint on the hollow journal of the pump where it unites with the air tube by means of a packing ring, substantially as above described.

45,123,—Drilling Machine.—Warren Lyon, New York City:

I claim, first, The arrangement, as herein shown and described, of the levers, I L, drill arbor, D, with weight, F, attached, the counter poise, M, on lever, L, and the rod, N, for the purpose specified.

Second, The projection, u, and sheath, p, p, on the face of upper side of the bed plate, P, in combination with the slide, R, screw, S, and the adjustable arm, Q, to which the bed plate is attached, all arranged substantially as and for the purpose set forth.

Third, The bracket, C, with the bearings, a, a, attached, when used in combination with the drill arbor, D, and its concomitant parts, as herein shown and described.

[This invention relates to an improvement on a drilling machine, for which Letters Patent were granted to this inventor bearing date September 20th, 1853.

46,124.—Testing Oil Wells.—Joseph C. Lyon, Auburn' N. Y.:

I claim the combination and arrangement of two flexible air chamberswith the air and discharge pipes, so that the air chambers can be placed at any point within the walls of oil wells, and there be inflated, whereby to cut off above the upper, and below the chamber water-gas and other substances, and thereby allow the oil to pass from a fissure between the two chambers and out of the discharge pipes, substantially as herein set forth.

46,125.—Breech-loading Fire-arm.—Isaac M. Millbank, Greenfield Hill, Conn.:

I claim as a new breech-loading fire-arm, combining the following elements, namely:—

The wedge, C, rotating on a hinged arm transversly to the axis of the barrel and provided, as well as the faces on which it impinges, with cleaning grooves, e, the front face of the breech piece having an annular bead projecting forward into a corresponding groove in the rear of the barrel, so that by the withdrawal of the wedge the breech piece may be freed to move to the rear, sufficiently to enable the bead to clear the sides of the groove, as the hinged breech piece is rotated out of its chamber and on being returned charged, may be driven home with the bead pressing upon the elastic packing of the groove, the whole arranged thus described, working upon or contained within a frame, A, which secures the barrel to the abutment.

[This invention consists, first, in a novel mode of applying a wedge in combination with breech piece which opens and closes with a swinging movement transverse to the bore of the barrel, for the purpose of forcing forward the said breech piece toward the barrel to make it form a gas tight joint therewith after it has been closed. It also consists in a novel mode of applying packages of india-rubber or other elastic material in combination with the barrel and movable breech piece of a breech-loading fire-arm for the purpose of making a gas tight joint, when the breech piece is closed.

46,126.—Car Coupling and Buffer.—Ezra Miller, Janesville, Wis.:

I claim, first, So constructing hooked head car couplings that they are adapted to receive links and other forms of couplers and form connections therewith substantially as described.

Second, A hooked head car coupling which is composed of wood and metal constructed substantially as described.

Third, Bending the heads or forward portions of the shanks of coupling hooks in such manner as to give them an even bearing on their stirrups and thus prevent them from tilting laterally in consequence of wear, substantially as described.

Fourth, Locating an elastic buffer in the end of the buffer beam, A, of a platform which is elevated so as to be brought in a horizontal plane with the bed of the car body, substantially as described.

Fifth, Constructing the buffer head, D', with a square shank, D, having a rounded extension, D'', on its ends substantially as described.

Sixth, Preventing lateral thrust of cars in motion by means of interlocking buffer heads constructed and operating substantially as described.

46,127.—Casting Grate Bar for Furnace.—Joseph A. Miller, New York City:

I claim casting two bars simultaneously on the same core substantially in the manner and for the purposes set forth.

46,128.—Canal Scraper.—Thomas Miller, Columbus, Ohio:

I claim the combination and arrangement of the tongue with projecting foot board and parallels, whereby the movable principle is attained for the scraper subject to the control of the operator substantially as set forth and for the purposes specified.

46,129.—Shingle Machine.—Enoch R. Morrison, New York City:

I claim forming the table, C, of a spring plate in such a manner as to furnish an elastic surface its whole length the same being provided with the projections, c c, and operating in combination with the riving knife, b, substantially in the manner and for the purpose herein set forth.

I also claim the pressure plate, M, made elastic by the spring, o, in combination with the way, N, and tooth bar, E, in such a manner that said plate will rise over the bar, but produce a pressure on the shingles in the rear substantially as specified.

I also claim the projections, k', on the under side of the pressure plate, M, which force the riven shingle to the bed plate if too short to be borne upon by the extreme end of the pressure plate, M, the whole arranged as herein set forth.

I claim also the arrangement of the gage slide, P, lever, v, and cam bar, Q, in combination with the tooth bar, E, projection, R, and cam, O, to retain and release the said tooth bar in the manner substantially as herein specified.

I also claim the arrangement of the bar, T, provided with the cams, c' c', and block, U, in combination with the tooth bar, F, and the cams, V V, for retaining and releasing the said tooth bar, substantially as herein set forth.

I also claim the combination and arrangement of the jointers, Y, arms, h' h', guides, z, and spring or sorings, g', in such a manner that said jointers act centrally on the shingles substantially as herein set forth.

46,130.—Cotton Seed Planter.—Isaac Myers and Marshall D. Wellman, Pittsburgh, Pa. Ante-dated Jan. 19, 1865.

We claim, first, The use of a feeding rod having a finger or fingers, which vibrate up and down through a suitable orifice in the bottom of the seed box so as to feed a few seeds only at a time and that at regular intervals substantially as described.

Second, I also claim in combination with the feed rod and fingers wires so placed in that part of the rod which passes through the cotton in the feed box for the purpose of loosening the mass of cotton seeds and separating them from each other substantially as described.

Third, Also the use of the sliding frame with or without the inclined planes and operated substantially as described for the purpose of supplying the cotton seed into the hopper box.

Fourth, Also the use of the curved projections, r r, on either side of the hopper box, to prevent the cotton being fed too fast into the hopper box, and clogging therein, substantially as described.

46,131.—Rammer for Revolving Fire-arms.—Frederick D. Newbury, Hudson City, N. J.:

I claim the method of attaching the ramrod to the frame of the piece by the use of revolving standard, S, in order to permit the employment of the same in combination with a cylinder constructed arranged and operated substantially as set forth in this specification.

46,132.—Row Lock.—Joseph W. Norcross, Middletown, Conn.:

I claim the inclined planes in combination with the row lock and pin on which the same swivels, whether the same be secured by the plate or gunwale or the row lock, substantially as and for the purpose herein set forth.

Also the spring catch applied in combination with the row lock and with the pin on which it swivels substantially as herein described for the purpose of holding the row lock in and prevent its coming out spontaneously.

[This invention consists in the use of inclined planes in combination with the row lock and pin on which the same swivels, whether the same be secured to the plate or gunwale or to the row lock, in such a manner that by the action of each inclined plane combined with that of the inherent gravity of the row lock said row lock is turned to a position parallel with the keel; the invention consists further in the operation of a spring catch in combination with the row lock and with the pin on which it swivels in such a manner that the row lock is easily held in its place and prevented from coming out spontaneously.]

46,133.—Sewing Machine Stitch.—Charles Parham, Philadelphia, Pa.:

I claim a machine made stitch formed by first making a loop in one thread, and passing a second loop of the same thread through the first loop, and then passing a second thread through the second loop, and drawing up the slack of the threads and loops tightly in the cloth or other material as it is fed along to receive the stitches as set forth.

46,134.—Process for Manufacturing Underground Pipes. A. H. Perkins, Chicago, Ill. Ante-dated Jan. 6, 1865:

I claim manufacturing pipe by casting prepared pitch or other bituminous substances or compounds between two concentric tubes of heavy fibrous paper, or felt, or its equivalent substantially as and for the purposes herein set forth.

46,135.—Riding or Warping Bit.—Charles Perley, New York City:

I claim the pair of grooved riding bits, formed and applied as and for the purposes specified.

46,136.—Fastening Pockets to Billiard Tables.—Louis Petersen, Baltimore, Md.:

I claim the peculiar construction of the metallic frame, carrying the pocket, as described within; and the manner of fastening these frames to the bands of billiard tables by means of screws passing the wood work of said bands and screwed into metallic nuts, sunk into them, substantially as specified herein before.

46,137.—Gang Plows.—John C. Pfiel, Arenzville, Ill.:

I claim the arrangement of parts by which the relative positions of the plow beam and the draught pole are maintained after the front of the former has been depressed by the foot of the driver, and consisting of the tension chain, K, and lever, G, with its retaining rack, J, the points of attachment being the draught pole, B, and the frame, A, the whole constructed and operated as described and represented.

[This invention relates to a new and improved gang plow, and it consists in constructing the same in such a manner that the plows may, when desired, be readily raised out of the ground by the driver in his seat and the depth of the penetration of the plows into the earth regulated as may be desired.]

46,138.—Lamp Burner.—Anson H. Platt, Yellow Springs, Ohio:

I claim the laterally movable wick regulator, H, operating substantially as and for the purposes herein specified, whether employed for regulating one or two wicks.

I also claim the horizontal sliding elastic bolt, D, for fastening the chimney, substantially as herein specified.

46,139.—Hay Loader.—Wm. Platt and A. G. Burnham, Greenfield, Pa.:

We claim in combination with the elevator, C, the arrangement of the rod, o, and the rocking frame, n n', pivoted on the bar, i, and connected to the rakes, D, by which the latter are raised as may be required, substantially as described and represented.

[This invention relates to a new and improved device to be attached to a cart or wagon for the purpose of raking up the hay and elevating and discharging the same into the cart or wagon as the latter is drawn along in the field and over the hay.]

46,140.—Adjustable Gun Scrapers.—E. L. Pratt, Boston, Mass.:

I claim so applying each scraper blade, c, that it swivels or turns upon or with respect to its spring or wire, b, for the purpose substantially as set forth.

I also claim making each scraper, c, removable for repair, substitution or adjustment, substantially as set forth.

© 1865 SCIENTIFIC AMERICAN, INC.

46,141.—Coal Oil Stove.—Charles H. Reichmann, New York City:

I claim coal oil stove composed of one or more lamps provided with draught chimneys and arranged in connection with a drum, substantially as herein described.

Second, In combination with a coal oil stove constructed and arranged as above set forth, I claim the slide or door, h, and glass, f, applied to the lower part of the draught chimney in the manner and for the purposes specified.

46,142.—Safety Valve Regulator.—Peter Riordan, Washington, D. C.:

I claim, first, In combination with a cylinder formed in two parts, A A', of different diameters, I claim the piston heads, B B', when so arranged that the effective area of the head, B, on that side next the steam port, a, exceeds the effective area of the head, B', on the side next the port, a', by as much as the area of the safety valve divided by the number of times by which the length of the long arm of the safety valve lever exceeds that of short arm.

Second, I claim the combination of the valve, F, spring, E, and adjustable nut or collar, G, with the hollow graduated shaft, D, and apertures, d, the whole being arranged and employed substantially as and for the purpose set forth.

46,143.—Process for the Manufacture of Fuller's Soap.—J. F. Rich, Chatham Run, Pa.:

I claim a soap made by treating the liquor in which wool and card strippings or other greasy waste have been scoured with salt alkalies of other saponifiers substantially in the manner herein set forth.

[The nature of this invention consists in a soap made of the liquor in which wool and card strippings or card strippings mixed with other greasy waste have been scoured, such liquor being treated with potash ley, soda ash or other saponifiers and if necessary mixed with an additional quantity of fatty matter if not sufficient fat should be obtained from the scouring process.]

46,144.—Press and Bulk Heads.—Samuel J. Seely, New York City:

I claim, first, Forming water-tight walls partly subaqueous for piers or similar structures of miter-locked sections to utilize the area they enclose substantially in the manner described.

Second, Forming sections for the construction of piers, substantially as described, so that one will firmly interlock with another and exclude the passage of water between them as set forth.

Third, The combination in piers or similar structures of sections that will permit the entrance of light to the area they enclose with suitable fenders to protect them arranged substantially in the manner and for the purpose set forth.

46,145.—Car Wheel.—Samuel J. Seely, New York City:

I claim, first, The combination of the flanged hub with the flanged rim by means of the corrugated face plates, substantially in the manner described for the purposes set forth.

Second, The wooden disk arranged between the rim, the hub and the face plates, substantially as and for the purposes described.

46,146.—Construction of Docks, &c.—Samuel J. Seely, New York City:

I claim, first, The construction of a dock, lock, or other subaqueous structure exposed to the contact of vessels, having metallic tubular supports united together with beams or girders, or trusses of iron, or wood and iron combined, in combination with a fender of wood, or iron, or both, combined with an elastic substance or spring interposed between the dock and fender to prevent injury to the structure from shock or pressure applied to the fender, constructed and operated substantially in the manner above described.

Second, I also claim the combination of a tank vessel or wall of iron, or iron and cement combined, having tubular supports with a fender and forming a dock, lock, wall, or other subaqueous structure exposed to the contact of vessels, so constructed and operating as to ease off all sudden shocks, and to be braced within the structure, substantially as above described.

46,147.—Rudder with Corrugated Surfaces.—Samuel J. Seely, New York City:

I claim corrugating the sides of the blade of rudders, substantially in the manner and for the purpose set forth.

46,148.—Coal Scuttle.—S. B. Sexton, Baltimore, Md.:

I claim, first, Providing a coal scuttle with a hinged plate which is so arranged within the scuttle as to serve as a screen, for sifting coal dust and ashes, or as a shield for preventing lumps of coal from escaping over the sides of the scuttle during the act of replenishing the fire.

Second, Constructing the hinged plate, A, with flanged sides, substantially as described.

46,149.—Machine for Cutting Staves.—H. M. Shaw, Fremont, Ohio:

I claim the slotted arms, a, of the fly wheels, c c, to receive the pins, E E, of the cranks, F F, the shafts, G G, of which are placed out of line with the fly wheel shaft, B, and all arranged in connection with the pitman, H H, to operate the knife frame, I, substantially as and for the purpose herein set forth.

[This invention relates to a new and improved machine for cutting staves for barrels, casks, etc., from bolts of steamed wood, and it consists in a novel construction and arrangement of certain parts whereby the work may be done in a neat and perfect manner and with but a moderate expenditure of power.]

46,150.—Bread and Meat Slicer.—Hiram M. Shaw and Charles B. Stillwell, Fremont, Ohio:

We claim, first, the knife, H, attached to a sash or gate, B, having a rising and falling movement communicated to it by cranks and connecting rods or their equivalents, and the knife having an automatic reciprocating movement communicated to it from the sash or gate through the medium of the lever, I, and rod, J, from the crank or drawing shaft, substantially as and for the purpose set forth.

Second, The adjustable gage, F, attached to the sash or gate, B, substantially as shown, when used in combination with the knife, H, and all arranged to operate substantially as and for the purpose specified.

Third, The adjustable bottom, G, in combination with the gage, F, and knife, H, all arranged to operate as and for the purpose set forth.

[This invention relates to a new and improved implement or device for cutting or slicing bread, dried beef, vegetables and other articles or substances, and it consists in the employment or use of a rising and falling gate or sash with a gage and knife attached, the latter having, besides the rising and falling movement given it by the gate, a reciprocating movement, the gage being adjustable and all arranged in relation with a feed-box and in such a manner that, by the turning of a shaft continually in one direction, the article or substance within the feed-box will be cut or sliced expeditiously and with but moderate expenditure of power.]

46,161.—Clothes Dryer.—Elbridge Sims, Antwerp, N. Y.:

I claim a clothes dryer composed of a series of frames, A B C, connected together by pivots or joints, suspended on a wall or vertical support and provided with bars, D, all arranged substantially as described.

[This invention relates to a new and improved device for holding clothes while drying, and it consists in the employment or use of a series of frames connected by pivots, suspended from a wall, and provided with arms whereby a very convenient and portable device is obtained for the purpose specified.]

46,152.—Turning Lathe.—Dwight Slate, Hartford, Conn.:

I claim the employment in combination with the guide bar, g, and with the adjusting screw, d, or its equivalent, of the tool carriage, of the connecting bar, f, arranged substantially as herein before set forth.

I also claim the employment in combination with the guide bar and connecting bar aforesaid of the slide, l, jointed to the connecting bar and locked to the guide bar substantially as and for the purpose herein before specified.

46,153.—Meat Chopping Machine.—Alfred F. Spalding and Salmon M. Scott, Winchendon, Mass.:

We claim the improved machine constructed substantially in manner and so as to operate as described, that is to say with the safety spring or springs, v, arranged with each of the knife carriers and its operative mechanism as described, the knife or knives being arranged to work in a rotary tub in manner as explained.

46,154.—Tool for Drawing Spikes.—George Stone, Boston, Mass.:

I claim the handle or lever, A, formed or provided with the jaw, B, in connection with the rocker-shaped fulcra, c c, provided with the jaw, D, and having the handle or lever secured between them by a pivot bolt, substantially as and for the purpose herein set forth.

[This invention relates to a new and improved implement or device for drawing spikes, large nails, pins, etc., and it consists in the employment or use of a handle or lever, the lever end of which is provided or formed with a jaw of curved form, the handle or lever at its junction with the jaw being secured by a pivot bolt between two rocker-shaped fulcra which are connected at one end and so constructed as to form a jaw; all being arranged in such a manner as to admit of spikes, nails, etc., being drawn with the greatest facility.]

46,155.—Corn Sheller.—Peter Sweeney, New York City:

I claim, first, The revolving open cylinder, D, with a helical flange, b, and pegs, d, in combination with a series of hoppers, F, arranged around said cylinder and operating substantially in the manner and for the purpose herein shown and described.

Second, The perforations, g, in the plates, c' d', composing the hoppers, arranged substantially as and for the purpose described.

46,156.—Process for making Concentrated Fluid Extracts.—N. S. Thomas, Painted Post, N. Y.:

I claim the within-described process of producing concentrated fluid extracts by bringing the crude drug gradually in contact with the desired measure of liquid to be represented by the extract, and exposing it after each application of liquid to a heavy pressure, substantially as set forth, whereby extracts of uniform strength can be made and both heat and evaporation are avoided.

[This invention relates to an improved process of producing that class of extracts which are made so that a certain amount of liquid shall represent pound by pound medically the same quantity of crude drug, and which are generally obtained by extracting with a large excess of liquid and evaporating down to the desired density.]

46,157.—Apparatus for Fluting Trimmings.—Sineous Totten, Brooklyn, N. Y.:

I claim a fluting apparatus consisting of a series of rods, C D, and one or more frames, A, arranged and operated substantially as shown and described.

[The object of this invention is to obtain a simple and economical apparatus by which trimmings for ladies' wearing apparel, such as dresses, cloaks, etc., may be fluted expeditiously and in a perfect and durable manner.]

46,158.—Artificial Arms and Hands.—Thomas Uren, New York City:

I claim the combination of the expansion and contraction cords with each other and with the artificial upper and fore-arm hinged at the elbow joint, and with the straps, or equivalent thereof, for securing the artificial arm to the body, and with which the said expansion and contraction cords are attached, substantially as described, whereby the fore-arm can be lifted and bent, or thrown out and straightened at the will of the person wearing it, by a simple motion forward or backward of the stump of the amputated arm.

I also claim the combination of the hinged fore-arm with the balance cord and spring, substantially as described, whereby the weight of the hinged fore-arm is balanced by the said spring, and when desired can be made to hang naturally, as described, whilst at the same time the fore-arm, being so balanced, will greatly facilitate the motion to be imparted to the artificial arm.

I also claim the combination of the expansion and contraction cords with the balance cord and spring with the hinged fore-arm, substantially as and for the purpose specified.

I also claim the combination of the hinged hand, the turning wrist piece, the fore-arm, and the hinged connecting rod, substantially as and for the purpose specified.

I also claim the hinged hand, the turning wrist piece, the fore-arm and the hinged rod by which they are connected, substantially as specified, in combination with the means of connecting the said hinged rod with the fore arm by a turning joint and spring or equivalent adjustable connection, substantially as specified, so as to admit of turning the wrist, as set forth.

I also claim the hinged fingers with the contraction cords and the spring with which the said cords are connected, substantially as described, whereby the fingers and, as an equivalent, the thumb can be contracted, as set forth; and this I claim whether the said spring be located within the hand or on the arm, as set forth.

I also claim the hinged fingers, the contracting cords and the spring connected therewith, in combination with the expansion finger cords, substantially as described, whereby the fingers can be opened or closed at the will of the person wearing the artificial hand, as set forth.

46,159.—Artificial Arms and Hands.—Thomas Uren, New York City:

I claim combining the fore-arm which is hinged at the elbow to the upper artificial arm, with a cord attached to the back of the fore-arm and below the elbow joint, and which passes over a guide roller mounted in the fore-arm and near the lower part thereof, and thence through the back of the upper arm and attached to the strapping at or near the back, substantially as described, thus enabling me to produce an artificial arm for an upper amputation, which, by a single connection, will enable the person wearing it to move the arm at will, as described.

I also claim the spring arm or lever which projects to the outside of the fore-arm, so as to be operated by bearing against any resisting object, substantially as described, in combination with the jointed fingers and the expansion and contraction cords, substantially as and for the purpose specified.

46,160.—Blueing Paste.—Robert G. Vassar, Poughkeepsie, N. Y.:

I claim the peculiar combination of the above ingredients forming a more economical and perfect blueing than any now in use.

46,161.—Chest-expanding Suspenders.—G. W. Walker, Lowell, Mass.:

I claim the openings, V V, in the shoulder pieces, D D, of chest-expanding suspenders when made and applied substantially as herein described and shown and for the purpose set forth.

46,162.—Making Corrugated Funnel Spout.—Jonathan Walton, Brooklyn, N. Y.:

I claim the process of making corrugated funnel spouts by first crimping the flat plate between corrugated plates, E E, and afterward turning it around a longitudinally corrugated mandrel and pressing it thereon between corrugated dies, all as hereinbefore described.

46,163.—Making Bonnet Binding.—Jefferd L. Weaver, Orange, Mass.:

I claim the above described continuous bonnet binding, the same being produced by arranging the warps or strands alongside of and so as to lap by and on one another, as explained, holding each strand in place by means of strings and weights until woven into place, and finally connecting the warps by a filling or weft woven into them, substantially as specified.

46,164.—Gang Plow.—Henry Webster, Beetown, Wis.:

I claim, first, The employment or use in a mounted gang plow of an oblique adjustable axle so arranged as to admit of the ready adjustment of the wheels for giving the plows more or less land, substantially as set forth.

Second, The frame, H, applied to or connected with the draught pole, A, by means of a joint in connection with the racks and toothed segments, when applied to a gang plow, substantially as set forth.

[This plow is for turning two or more furrows simultaneously, and it consists in a means for readily guiding the plows so as to give the same more or less land, and also in a means for raising and lowering the plows to regulate the depth of their penetration in the earth and to elevate them above the surface of the same when not required for use.]

46,165.—Steam Engine.—Thomas Welham, Washington, D. C.:

I claim placing one, two or more right and left-hand screws in the cylinders, as herein described, on the inside or outside of a steam or gas boiler, so as to receive and discharge the steam or gas, substantially as and for the purposes set forth.

46,166.—Universal Shafting.—Thomas Welham, Washington, D. C.:

I claim a revolving shaft made of flexible material so as to operate in various positions or any curve, in the manner and for the purposes set forth]

46,167.—Hydraulic Brush.—Thomas Welham, Washington, D. C.:

I claim the arrangement and combination of the revolving brush and the revolving water wheel attached to the point of a water spout or hose, as herein described and for the purposes set forth.

46,168.—Folding Bucket.—H. W. Wilcox, Columbus, Pa.:

I claim a folding pail or bucket composed of a rim constructed of a number of parts, B, connected together by joints and having a flexible water-proof substance attached to them to form the body of the pail or bucket, and the rim having a jointed handle, C, attached, all constructed and arranged substantially as set forth.

[The object of this invention is to obtain a pail or bucket which, when not in use, may be compactly folded so as not to monopolize much space and still be strong and durable, and capable of being readily expanded when required for use.]

46,169.—Reaping Machine.—David Wolf, Lebanon, Pa.:

I claim a platform for reapers, composed of two or more parts connected by a joint or joints, and arranged to operate in the manner substantially as herein shown and described.

[This invention consists in constructing the platform with a hinge or joint, in such a manner that it may be moved or adjusted, either by an attendant or an automatic arrangement, so as to discharge the cut grain from it.]

46,170.—Harvesters.—Alonzo Wood, Henrietta, N. Y.:

I claim adjusting the reels of harvesters so as to adapt them to the inequalities of hight of the straw in a field of grain by means of the arms, G G, hand wheel, N, chains or cords, M M, or equivalent, and pawl lever, P, the whole so arranged that the driver can operate the same without stopping the machine, substantially as herein set forth.

46,171.—Steam Boilers.—Enos D. Wood, Utica, N. Y.:

I claim the domes, A C, or their equivalents, constructed and arranged in combination, substantially as described, for the uses and purposes mentioned.

46,172.—Shirts.—Abraham Wormser, New York City:

First, I claim combining with a shirt made without a bosom a removable bosom attached around the edges to such shirt as specified.

Second, I claim forming the neckband or band upon said bosom to bottom, or be attached to the shirt at the back of the neck, as set forth.

46,173.—Low-water Detectors.—Joseph Yates, Mott Haven, N. Y.:

I claim, First, The combination and arrangement of the float, D, the chest, C, the rod, E, lever, F, and the rods, H H, substantially as and for the purpose set forth.

Second, I claim the elastic diaphragm or diaphragms, I, in connection with the levers, F, rods, H H, and the lever, G, substantially as and for the purpose specified.

46,174.—Shoe Lasts.—Samuel K. Abbott, Salem, N. H., assignor to Joel D. Champion, Nashua, N. H.:

I claim the instep block fastener, composed of the bow spring, e, and the strap, d, arranged with respect to one another and the remainder of the last, substantially in manner and so as to operate as described.

46,175.—Washing Machine.—George N. Bolles (assignor to S. W. Walker & Co.), Kalamazoo, Mich.:

I claim the rotating or reciprocating rotating tub, G, in combination with the self-adjusting or rising and falling follower, H, the guide-bar, J, on the framing, A, uprights, I, on the follower, H, hinged bar, K, and catch bar, L, all arranged substantially as and for the purpose specified.

[This invention relates to a new and improved clothes-washing machine of that class in which an ordinary wash tub is employed with a follower. The object of the invention is to obtain a washing machine of the class specified which may be operated with greater facility than hitherto, and perform the desired work expeditiously and in a perfect manner.]

46,176.—Ears for Paint Cans.—Charles F. Brand (assignor to Harris Brothers & Co.), Philadelphia, Pa.:

I claim combining the slips, a a, with the ears, D D, of paint cans, substantially in the manner and for the purpose above described.

46,177.—Fruit Basket.—W. H. Burridge, Cleveland, Ohio, assignor to Adams, Jewett & Co.:

I claim the herein described article when made and formed substantially as and for the purposes set forth

46,178.—Harvester.—Wm. F. Cochrane (assignor to himself and Warder & Child), Springfield, Ohio:

I claim, First, The combination of the girder side pieces, a a', with the end brackets, C C', and middle brackets, i2, substantially in the manner described for the purposes set forth.

Second, Constructing the frame brackets, C C' and 12, substantially as described, for the purpose of adapting them to either a right or left-hand machine.

Third, Constructing and arranging the sides, A A, of the frame substantially in the manner described, so as to permit them to be reversed and shifted from one side to the other, in order to change from a right to a left-hand machine, or vice versa, as set forth.

Fourth, The combination of the trifurcated brace, R, with the inner shoe tongue and frame, substantially as and for the purpose described.

Fifth, The combination of the driver's seat and footboard pivoted on the post, U, and connected by the rod, t, with the gage bar, v, as and for the purpose described.

46,179.—Harvester.—Wm. F. Cochrane (assignor to himself and Warder & Child), Springfield, Ohio:

I claim, First, Mounting the crank shaft in swiveling bearings, substantially in the manner described, for the purpose set forth.

Second, The combination of the shell-bracket, M, with the level wheel, N, and pinion, o, as described, for the purpose of protecting the gearing.

Third, Arranging the crank shaft between the frame timbers, a a, and within the bracket, C', as and for the purpose described.

Fourth, Mounting the counter shaft in the brackets, I M, constructed in the manner described and for the purposes specified.

Fifth, The combination of the driving wheel, spur pinion, pinion shaft and nut, J, with the main frame, substantially in the manner described, for the purpose of raising the frame as described.

45,180.—Harvester.—Wm. F. Cochrane (assignor to himself and Warder & Child), Springfield, Ohio:

I claim, First, The combination of the driving wheel, tubular axle, sleeved radius-bars and main frame, substantially as and for the purposes described.

Second, The shell-brackets, I I', constructed and combined substantially as and for the purpose as described.

Third, The combination of the shell-brackets and main frame, substantially as and for the purpose set forth.

Fourth, The combination of the radius-bars, shell-brackets and panels and ratchets, substantially as described, for the purpose of holding the frame at any desired elevation, as set forth.

46,181.—Harvester.—Wm. F. Cochrane (assignor to himself and Warder & Child), Springfield, Ohio:

I claim, First, A vibrating slotted link or guide, which embraces the arm or stall of a vibrating sweep rake, and positively controls the movements of the rake, substantially in the manner and for the purpose described.

Second, The combination of an automatic rake with a vibrating slotted link or guide and a gravitating stop latch, substantially in the manner described, for the purpose set forth.

Third, The combination of the rake arm with the swiveling socket or collar, f, substantially as described, for the purpose of varying the angle of the rake teeth relatively to the platform, as specified.

Fourth, Mounting a vibrating slotted link or guide, which positively controls the movements of an automatic rake, on an adjustable stud, g', as described, for the purpose of varying the path of the rake, as set forth.

© 1865 SCIENTIFIC AMERICAN, INC.

Fifth, The combination of an automatic vibrating sweep rake, a vibrating guide and a tension brake, for the purposes both of diminishing the force with which the rake strikes the gavel and of holding the rake down upon the gavel when raking off.

Sixth, Driving an automatic rake through the center of the driving wheel and from the outer side thereof, substantially as and for the purposes described.

Seventh, The combination of the pinions, d d1 d3 d4, as described for the purpose of varying the speed of the rake, as set forth.

Eighth, A tension brake to regulate the force with which an automatic vibrating sweep rake drops upon the platform.

46,182.—Harvesters.—Wm. F. Cochrane (assignor to himself and Warder & Child), Springfield, Ohio:

I claim the combination with the horizontal main frame of a harvester of a swan-shaped vertical frame, C, substantially in the manner described, for the purposes set forth.

46,183.—Harvesters.—Wm. F. Cochrane (assignor to himself and Warder & Child), Springfield, Ohio:

I claim, First, The combination of the spur wheel, E, idle wheel, F, and pinion, G, with the crank shaft, G', substantially in the manner described, for the purpose set forth.

Second, Mounting the rake gearing in the detachable frame or edplate, H, as described, for the purpose set forth.

46,184.—Portable Lanterns.—Charles Deavs (assignor to E. P. Archer and George Pancoast), New York City:

I claim the combination of the candle tube, E, with the lantern case, A, when the tube is arranged so as to slide within the case and capable of being shoved entirely within it and drawn out wholly or partially from it, substantially as and for the purpose herein set forth.

46,185.—Churns.—Alexander W. Hall, New York City, assignor to Almon & Albert Hall, Columbus, Ohio:

I claim the fixed attachment of the dasher of a churn to a stationary support, and the suspension of the tub, box, barrel, or body of the churn, in such relation to the stationary dasher that it and the contained milk may receive the necessary motion to produce the separation of the butter from the milk, substantially as herein described; or, in other words, I claim a churn with a stationary dasher and a movable body, substantially as herein set forth.

46,186.—Stop-motion for Circular Knitting Machines.—Philo W. Hart, Stamford, N. Y., assignor to the Dalton Knitting Machine Company, New York City:

I claim the movable pin or piece, c, in combination with the slide, I, or its equivalent attached to the bobbin stand, and with a groove or recess in the bobbin, substantially as and for the purpose herein specified.

46,187.—Combined Valise and Seat.—Stoughton B. Holden (assignor to himself and L. L. Holden), Woburn, Mass.:

I claim a combined valise and seat, composed of two parts, a a', connected by hinges, b, one part, a, being provided with a bottom or seat, B, and the other part with an internal lid, c,' and both parts supported by legs, D, when the device is used as a seat, the le s being removable, and all constructed and arranged as herein described.

[This invention relates to a new and improved combination of a valise and seat, whereby the valise when unfolded may be converted into a seat with abundant room to receive or hold different articles required for use by mechanics, artists, fishermen, etc, and the valise when folded capable of containing necessary clothing, besides the tools or articles above specified. For information, address L. L. Holden, *Herald* office, Boston, Mass. An engraving of the invention will soon be published in the SCIENTIFIC AMERICAN.]

46,188.—Brick Machines.—W. A. Horrall (assignor to himself and Albert W. Cross), Washington, Ind.:

claim so connecting the mechanism which drives the molds to the gear wheel on the pressure roller shaft that the mold and periphery of the pressure roller shall move in exact unison, by which their passage is facilitated and the clay evenly pressed, substantially as herein described and represented.

[This invention relates to a new and improved machine for pressing and molding bricks, and it consists in the employment or use of a mud mill, a pressure roller, clay box, and an endless band, all arranged in such a manner as to admit of the work being performed very expeditiously and in a thorough manner.]

46,189.—Machinery for Oiling Wool in Carding Machines.—John W. Hussey (assignor to himself and Geo. H. Quincy), Boston, Mass.:

First, In carding or other wool-preparing machinery and in combination with the pressure roller of an oiling apparatus of otherwise ordinary or suitable construction, I claim an independent scraper, or its equivalent, so arranged as to keep the pressure roller clear of the wool adhering to its surface.

Second, In combination with the pressure roller of an apparatus for oiling wool as it is fed to carding or other wool-preparing machinery, I claim an endless apron interposed between the said pressure roller and the top feed roller and moving in the direction of the said rollers, so that the surfaces in contact move in opposite directions, substantially in the manner and for the purposes set forth.

46,190.—Harvesters.—Samuel Johnston (assignor to himself and Rufus L. Howard), Buffalo, N. Y.:

First, I claim constructing a harvesting machine, which I call the "Great Western," with the finger beam located opposite or nearly opposite to the tread, and the gearing located mainly within the periphery of the driving wheel, and with the finger beam and gearing so arranged that both can be raised and lowered together to any desired hight, and still preserve the same relation to each other and the free working of the same, all constructed and arranged substantially as set forth and for the purposes described.

Second, I claim the standard, m m, located within the periphery of the driving wheel, the main plate, l l, and the perpendicular line shaft, e e, for supporting the finger beam and gearing and allowing them to be adjusted to the required hight, arranged substantially as described and for the purposes set forth.

Third, I claim the perpendicular grooved line shaft in combination with the feathered clutch, and arranged and constructed as described for the purposes herein set forth.

46,191.—Machine for indicating Carpenters' Squares.—Horace K. Jones (assignor to the Hart Manufacturing Company), Kensington, Conn.:

I claim, First, The method substantially as described for cutting the division marks on carpenters' squares and rules.

Second, The toes, i, and yielding beds, D, in combination with the gravers, a, applied and operating substantially as and for the purpose set forth.

Third, The screw clamps, g, applied in combination with the gravers, a, substantially as herein specified, for the purpose of holding them in their places and to govern the depth of the cuts.

[This invention consists in the use in a machine for indicating carpenters' squares, etc., of a series of gravers arranged on the circumference of a roller or cylinder and capable of making marks of different lengths; also, in combination with each graver, a toe and yielding bed, for the purpose of governing the length of the marks to be made; finally, in a clamp acting as gage to regulate the depth of the cut and to confine the graver.]

46,192.—Movable Calks and Toes for Horse Shoes.—Samuel Loyd (assignor to himself and Wm. H. Frear), Washington, D. C.:

I claim the calks, B B', constructed in the manner herein described and represented, and employed in connection with the screws, C C', in the manner and for the object specified.

46,193.—Steam Generators.—Barney McGinnis, New York City, assignor to himself and Reuben S. Torrey, Brooklyn, N. Y.:

I claim, First, The system of high-pressure boilers, B B', arranged in the interior of the shell or boiler, a, in the manner and for the purpose substantially as herein shown and described.

Second, The back flue, e, in combination with the double-walled shell, a, and return flue boilers, B, constructed and operating substantially as and for the purpose set forth.

[This invention consists in the arrangement of a system of high pressure boilers, calculated to carry steam of 200 (more or less) lbs. pressure to the square inch, in the interior of a double shell which forms a low-pressure boiler calculated to carry steam of 20 (more or less) lbs. pressure to the square inch, and connected in such a manner that the inner or high-pressure boilers can be supplied with water from the outer or low-pressure boiler, and if salt water or impure water is used all the sediment will be retained in the outer boiler, from which it can be readily removed. The inner boiler will be always supplied with clean water, and high pressure steam can thus be produced from salt water as well as from fresh water without injury to the boiler.]

46,194.—Machinery for Oiling Wool in Carding Machines.—John Shim (assignor to himself and Isaac Stead, said Stead assigns his right to Nicholas H. Graham), Philadelphia, Pa.:

In combination with a wool-oiling apparatus, I claim raising oil from the tank by a wick or capillary attraction, for the above-described purpose.

46,195.—Knapsack.—Jacob Weber, New York City, assignor to himself, Wm. Wharton, Jr., Philadelphia, Pa., and Ira B. Snyder, New York City:

First, I claim constructing the frame of a knapsack with jointed and folding sides, connected to a central section, C, substantially as above described.

Second, I also claim in a knapsack which is capable of being turned into a couch, supporting the outer folding rails, both when it is extended and when it is folded up, by means of brackets found on the supports, c, substantially as described.

Third, I also claim the combination with a folding knapsack, constructed substantially as above described, of a canopy and ribs, i, as set forth.

[This invention consists in a novel construction of knapsack, which is capable of being changed into a couch merely by opening it.]

46,196.—Lubricator.—Jean Francois August Aerts and Paul Francois Aerts (assignors to Jean Francois Aerts), Antwerp, Belgium:

We claim, first, In combination a shaft or axle, a reservoir of water or lubricating liquids or mixtures thereof, a brass or bearing, so grooved or channeled, substantially as described, as to receive and carry water or fluid lubricating material to the rubbing surfaces, and a disk or wheel attached to and revolving with the shaft, so as to carry fluid lubricating material and supply to a brass, the combination operating substantially as set forth.

Second, We claim, in combination with an axle or shaft and a reservoir of water a channeled brass and a rotating disk and a close box, preventing the entrance of dust and the escape of water, and in which the joint between the box and the axle is closed by packing rings, applied substantially as described.

Third, We claim, in combination with a packing ring, making a joint with an axle, a concave or dishing protector attached to or making a part of a wheel or an axle, and acting substantially as described.

Fourth, We claim, in combination with a box and a reservoir of water a guard plate or disk, making a partition between the front inclosure of the box and a water-lifting apparatus, substantially as described.

46,197.—Manufacture of Molded Candles.—John Lyon Field, Lambeth, Great Britain:

I claim a molded candle, the lower end of which is made of a tapering form, substantially as represented and described, for the purpose set forth.

46,198.—Manufacture of Zinc.—James Webster, Birmingham, Eng. Patented in England May 18, 1864:

I claim as my invention extracting zinc from its ores by causing the latter to be brought into contact with molten iron or other metal in a close vessel.

46,199.—Flocked Cloth, Dyed or Printed.—Thomas Croply, Bridgeport, Conn., assignor to The American Water-proof Cloth Company, Brooklyn, N. Y.:

I claim an article or fabric prepared, dyed and printed, or either prepared, dyed or printed, with a face of flocks of wool, silk, fur or other material possessing the character and qualities herein set forth, as a new manufacture.

46,200.—Dyeing, Printing and Manufacturing of Water-proof Cloth.—Thomas Croply, Bridgeport, Conn., assignor to The American Water-proof Cloth Company, Brooklyn, N. Y.:

I claim the process, substantially as hereinbefore described, of preparing, dyeing and printing goods, having a surface of flocks of the character hereinbefore described.

RE-ISSUES.

1,856.—Pumps.—Wm. A. Bemis, Lyndon Centre, Vt. Patented Aug. 9, 1864:

I claim the two plungers, D D', the rods, E E', of which are connected by a lever, G, having rods, H, connected to it, and all arranged with a platform, F, to operate as and for the purpose set forth.

1,857.—Railroad Car Brakes.—John Davis, Alleghany City, Pa. Patented Oct. 20, 1863:

I claim, first, A brake for wheel vehicles, brought to bear on the wheel by a spring and a cessation or relaxation of the power applied to draw the vehicle, and retracted therefrom by the said drawing power, substantially as herein described, and for the purpose set forth.

Second, The arrangement of the bars, e and f, guide plate, d, brakes, c, springs, s, levers, p and q, rods, l j k m and n, swivel plate, 5, pieces, o and 7, and brace, v, the whole being constructed, arranged and operating in the manner and by the means herein described, and for the purpose set forth.

1,858.—Machine for Loading Metallic Cartridge Cases.—Charles H. Lavis, Philadelphia, Pa. Patented Aug. 9, 1864:

I claim, first, Raising the shell or case of the metallic cartridges, for the purposes as herein shown and described.

Second, The block, m, or its equivalent, for the purpose specified.

Third, The groove, l, in the loading wheel, for the purpose set forth.

Fourth, The combination of the block, m, and groove, l, as substantially described.

1,859.—Heater for Smoothing Irons.—William F. Shaw, Boston, Mass. Patented Sept. 1, 1857:

I claim the combination of a heating apparatus, in which gas or hydro-carbon vapors are used as or for fuel, with a stand or support, B, made so as to gather the heat and products of combustion, and conduct them into the chamber or interior of the iron, substantially as specified.

Second, I also claim making the flat-iron, D, with an ascending flue or flues, i i and h, inlet and discharge openings, k and l l, arranged in the body of the iron, and so as to be used with a burner and stand, substantially as specified.

I also claim so constructing the stand or rest, n, for sustaining the handle of the flat-iron, as to cause the face of the iron to take an inclined position, as and for the purpose specified.

I also claim making the stand or support, B, with a tubular projecting neck, as and for the purpose specified.

1,860.—Coating Barrels to Render them Oil-tight.—The U. S. Barrel-coating Company, New York City, assignees by mesne assignment to Albert J. Hook and J. H. Darlington. Patented June 7, 1864:

I claim, first, Sealing barrels and other vessels by means of a compound of glue and molasses, or their equivalent, substantially as and for the purpose above described.

Second, Subjecting the said composition, after it has been applied to the vessel under treatment, to the action of tanning, substantially as and for the purpose above described.

DESIGN.

2,027.—Revolving Pistol Handle.—George A. Hickcox, Brooklyn, N. Y.

EXTENSION.

Trigger-operating Revolving Fire-arms.—Stanhope W. Marston, New York City. Patented Jan. 7, 1851. Re-issued Aug. 21, 1860:

I claim, first, So constructing the lock of revolving breech fire-arms, which may be operated by trigger, as that the hammer when raised to full cock, preparatory to firing, may be retained in that position of unstable equilibrium until the piece is fired on a further pressure of the trigger, by means of a vibrating tooth or fly tumbler, independently of any dog, pawl, catch or other mechanical device for that purpose.

Second, So constructing and arranging the lock of revolving breech fire-arms, susceptible of operation by trigger, as that when the hammer is raised to cock, preparatory to firing, the trigger shall be held back or retained in a drawn position by means of a vibrating tooth or fly tumbler.

Third, The use in revolving breech fire-arms of a vibrating tooth or fly tumbler interposed between the hammer and trigger, and operating substantially as hereinbefore described, by an upward pressure on the hammer, so as gradually to increase the leverage, and consequently the power applied to raise the hammer, and thereby reduce the effective resistance of the main spring, for the purpose of securing steadiness of aim, and greater ease in firing, and also to allow the recovery of the trigger, after firing, for repeated action.

NOTE.—The above long list of claims indicates the activity of inventors, and the prosperity of this very useful class of our community. There has come to our knowledge, latterly, a number of transactions between patentees and purchasers of rights where the former have received very large sums of money for their patents. One sale was made in our office a few days ago, when an inventor received $5,000, cash, for a partial interest in an invention, before the party had even taken any steps to secure his patent. Some idea may be formed of the activity among inventors when we state that over 200 applications for patents were made through the Scientific American Patent Agency alone during the past month—January. FIFTY THREE patents in the above list were secured through this office.—EDS.

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-THIRD of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *seventeen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from the three last ex-Commissioners of Patents.

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an

© 1865 SCIENTIFIC AMERICAN, INC.

opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row, New York.

Notes and Queries

J. J., of Vt.—We are pleased that you appreciate the value of our articles on lathe tools, and your suggestion to give a similar series on the hand lathe will be duly considered.

E. H. H., of Mass.—Antimony has the property of expanding as it cools; it is therefore used in type metal to make the alloy fill the mold. We know of no way of preventing the tin coating on your rods from wrinkling; it could be made smooth by rnishing.

S. A., of Iowa.—Very many substances are used for removing incrustations in steam boilers. The nature of the scale is different in different localities, and what is efficient in one case is totally useless in another. Winan's Incrustration Powder is said to have been efficacious in many boilers.

H. C. W., of Conn.—Address Jas. G. Stevenson, No. 200 Broadway, who manufactures turbine wheels.

W. T. B., of Mass.—We know of no metal as hard as brass which can be turned and filed like it. Perhaps type metal might answer your purpose.

C. O. P., of Ind.—For a gas engine address the *American Gas-light Journal*.

W. R. R., of Pa.—In general, a patent only covers the use of the device for the purposes set forth in the specification.

E. B. G., of N. Y.—An ownership in a patent is liable to seizure and sale for debt like any personal property.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, January 25, to Wednesday, February 1, 1865:—

J. N. E., of N. Y., $12; A. M. H., of N. Y., $25; W. G. W. J., of N. Y., $12; B. & H., of N. Y., $25; F. W. C., of N. Y., $25; G. L. S., of N. Y., $25; P. E., of N. Y., $25; J. L. C., of N. Y., $25; J. G. M., of N. J., $25; S. G., of Pa., $20; G. & C., of Conn., $20; J. D. W., of N. Y., $40; P. J., of N. Y., $20; L. W. W., of Mass., $20, J. B., of N. Y., $15; J. M. M., of N. Y., $20; O. E. M., of N. Y., $15; J. F. W., of N. Y., $15; P. S. H., of N. Y., $15; A. T., of Conn., $20; J. F. L., of Mich., $20; L. D., of Cuba, $15; T. M. L., of N. Y., $20; N. H., of N. J., $20; J. T., of N. Y., $20; W. A., of N. Y., $22; B. & F., of Eng., $20; E. S. M., of Conn., $10; A. O., of N. Y., $15; J. McC., of N. Y., $15; P. C., of Pa., $20; W. E. C., of Ill., $20; I. N. S., of Ill., $45; E. C. S., of N. H., $30; R. N., of N. Y., $40; G. W. M., of Mo., $40; J. E. M., of Ohio, $41; C. C., of N. Y., $45; E. C., of Mass., $10; G. H. G., of N. Y., $15; W. L. J., of N. Y., $55; H. B. M., of Mich., $45; F. K., of N. Y., $15; N. H., of N. Y., $45; T. S., of Cal., $20; C. H. H., of N. Y., $20; I. A. P., of Ill., $20; C. F., of Ill., $20; G. M. W., of N. Y., $15; D. F. H., of Mich., $45; E. H., of N Y., $15; E. B., of Ind., $20; G. A., of Mich., $22; W. N. B., of Ind., $2); S. H. M., of Ill., $20; J. L. R., of Ohio, $35; G. E. B., of Mass., $45; S. H., of Ill., $45; R. G., of N. Y., $15; H. H. W., of N. Y., $50; J. S., of N. Y., $15; A. J. N., of R. I., $45; M. V. C., of Mo., $20; T. R. T., of N. Y., $385; D. S. A of N. Y., $100; W. O. B., of N. J., $15; O. A. R., of N. Y., $15; C. G., of Mass., $16; W. T. H., of Md., $15; W. H. C., of Me., $25; J. H., of Pa., $25; J. S., of Ohio, $15; W. & T., of Vt., $15; G. D. G., of N. Y., $60; B. & McN., of Mich., $15; G. E. S., of Mass., $15; C. J. H., of Iowa, $20; R. M., of C. W., $35; H. W. G., of Ohio, $26; H. L. B, of Pa., $30; J. A. W., of N. B., $15; A. W. F., of Vt., $15; J. L. K., of Pa., $35; W. S. R., of Conn., $15; D. H., of N. Y., $10; E. B., of Wis., $16; H. J., of Ind., $10; V. W. B., of Vt., $15; J. C, of Ill., $30; C. J. F., of Iowa, $25; B. H., of Ill., $25; S. & G., of R. I., $25; A. J., of Pa., $25 S. M. F. R., of Ill., $25; J. L. G. B., of Mo., $16; J. N. P., of N. Y., $16; D. C., of Wis., $15; J. E. W., of Ill., $15; A. B., of N. Y., $50; C. & R., of N. Y., $16; J. W. A., of N. H., $15; W. G., of Mich., $16; T. C., of Ohio, $10; A. M. D., of Ill., $20; J. T. B., of Cal., $15; W. T. R., of Ill., $16; J. W. F., of Cal., $40; T. H., of Mo., $16; J. P. G., of Mo., $15; S. P. O. & Co., of Ill., $45; J. R., of Ind., $25; A. K., of Mass., $15; P. D., of Pa., $20; H. C. S., of Me., $15; J. S., of N. Y., $25; J. K., of N. Y., $25; A. M. O., of Ill., $25; N. K. & McC., of Ill., $16; E. B., of Mass., $25; C. B., of Mass., $130; G. H., of Ohio, $16; W. C.,' of Mass., $16; C. F., of Pa., $25; R. H. & J., of R. I., $15; C. B. B., of Mo., $16; C. R. R., of Conn., $50.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Jan. 25, to Wednesday, Feb. 1, 1865:—

J. N. E., of N. Y.; A. M. H., of N. Y.; W. G. W. G., of N. Y.; T. R. T., of N. Y.; B. & H., of N. Y.; F. W. C., of N. Y.; J. G. M., of N. J.; S. W. P., of Mass.; S. L. S., of N. Y.; P. E., of N. Y.; J. L. C., of N. Y.; J. D. W., of N. Y.; W. A., of N. Y.; R. N , of N. Y.; W. L. J., of N. Y.; H. H. W., of N. Y.; T. R. T., of N. Y.; A. J., of Pa.; T. H. C., of Mo.; J. S., of N. Y.; J. K., of N. Y.; A M. O., of Ill.; S. & G., of R. I.; C. J. F., of Iowa; B. H., of Ill.; T. C., of Ohio; B. & H., of Mass.; J. E. P., of N. Y.; W. H. C., of Me.; J. L. H., of Pa.; J. C., of Iowa; J. K. & C. B. C., of Iowa; G. M. F. R., of Ill.; J. H., of Pa.; D. L., of R. I.; O. & J., of Ohio; N. D. LeP., of Ohio; E. B., of Mass.; C. F., of Pa.; J. B. T., of Conn.

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

TO BRICK-MACHINE MANUFACTURERS.—WANTED, by the advertiser, a machine of 2-horse power, capable of turning out 10,000 Bricks per day. Address THOS. H. SENIOR, No. 56 Gold street, N. Y. 1*

WANTED—A BRICK MACHINE OF THE MOST practical kind, with the latest and best improvements. Address JOSEPH MOSER, Highland, Madison Co., Ill. Drawings and descriptions are desired. 1*

PORTABLE ENGINES, FROM 8 TO 16-HORSE POWER, ready for immediate delivery. C. GAY, No. 29 Doane street, Boston, Mass. 7 13*

D. L. HARRIS & CO., SPRINGFIELD, MASS., Manufacturers of Machinists' Tools, Steam and Power Pumps Bridges, Turn Tables, Bolts, Etc.
7 10* W. H. BURRALL, Superintendent.

CLOTHING BUREAU, QUARTERMASTER GENERAL'S OFFICE, WASHINGTON, February 3, 1865.

ARMY SUPPLIES.—SEALED PROPOSALS WILL be received at the office of Army Clothing and Equipage, New York City, until 12 o'clock, M, on WEDNESDAY the 8th inst., for furnishing by contract at the Depot of Army Clothing and Equipage, at New York City, Six-Mule Wagon Harness Complete, to be made according to specifications, which can be seen at this office.

Bidders will state the quantity they propose to furnish and the shortest time in which they can deliver it.

All proposals should be accompanied by a proper guaranty for the faithful performance of a contract.

The United States reserves the right to reject all bids deemed objectionable.

Proposals should be indorsed, "Proposals for furnishing Harness," and addressed to Bt. Brig.-Gen. D. H. VINTON,
1 D. Q. M. General, New York City.

SOMETHING NEW IN THE PERIODICAL LINE.—BRILLIANT AND SPARKLING—CHEAP AND GOOD!—COUSIN LIZZIE'S MONTHLY, a bright, sparkling, dashing little craft, full to the brim of good things in the way of stories, sketches, poetry, etc. Beautifully printed and illustrated, and one of the handsomest, best, and most amusing publications ever issued. A sure cure for the blues. A large package of specimens (different numbers) sent free of postage for 25 cents. Cut this out and send for them, or preserve it for future reference. All who have seen Cousin Lizzie's Monthly are delighted with it, and we believe you cannot invest a quarter to better advantage. Address COUSIN LIZZIE, No. 48 Ann street, N Y. [Editors inserting this will receive copy one year free.]
1

A VALUABLE PATENT CHEAP.—FOR SALE—THE Patent Rights and Improvements of the best Dovetail Machine in the world. The only one that makes the genuine old-fashioned dovetail. It does the work perfect in wood and metal, and as good as can be done by the best mechanics. Here is an opportunity equal to the sewing-machine interest. For further particulars address the inventor,
W. A. M'DONALD,
1* Mott Haven, Westchester County, N. Y.

WILLIAM MASON, MANUFACTURER OF PATENT Friction Clutches and Machinery, has sold his interest in the Machine Shop, Tools and Stock to V. Wm. Mason, who settles and continues the business. All favors will receive prompt attention.
V. WM. MASON,
7 4* Providence, R. I.

TO RAILROAD COS. AND MACHINISTS.—FOR SALE—Two Planers, 24 in. square by 6 ft. Not cheap, but first-class tools, well finished, strong and heavy; can be delivered at once. Four heavy, 36-in. Lathes, 18-ft. shears, partially completed and not yet sold. Address E. & A. BETTS, Tool Builders, Wilmington, Del. 7 4*

PARTIES WISHING AN AGENT TO INTRODUCE small patented articles and solicit orders in Massachusetts can hear of a responsible one by addressing (stating their best terms) L. D. H., Box 452, Milford, Mass. 1*

CAST-STEEL RAKE TEETH, OF A SUPERIOR quality, made to any pattern required, at low rates. No extra charge for coiling teeth. Address C. COLEMAN, Allegheny City, Pa. 7 12*

E. C. STRANGE, MANUFACTURER AND DEALER in Box-bound Shingle and Stave Machines, Cylinder Saws, Stave Planers, Barrel and Nail-keg Heading Machine, No 20 Broadway, Taunton, Mass. 7 6*

A SECOND-HAND GRAY & WOOD'S PLANER, with an Attachment for Planing Boards, for sale by F. W. BACON & CO., No. 84 John street, New York. 7 3

E. S. EASTERDAY, NOKOMIS, ILL., WANTS AN Agency to sell some useful invention. 1*

PLATINA—WHOLESALE AND RETAIL—FOR ALL purposes. H. M. RAYNOR, Importer, No. 748 Broadway, New York. Platinum Scrap of any sort purchased. 7 4*

FOR SALE.—THE ENTIRE RIGHT TO SCOFIELD'S Sewing Work-holder, illustrated in No. 26 Vol. XI., SCIENTIFIC AMERICAN. Sample with full particulars sent by mail on receipt of two stamps for return postage. Address H. G. SCOFIELD, North Stamford, Conn. 7 4*

R. HOE & CO., PRINTING PRESS SAW MAKERS, manufacture and keep on hand a large assortment of Mandrels for Circular Saws. Warerooms Nos. 29 and 31 Gold street, New York. Orders are solicited. 7 4*

LUNKENHEIMER'S IMPROVED GLOBE VALVE; A complete assortment of Brass Work for Locomotives, Portable and Stationary Engines. For samples and catalogue address
CINCINNATI BRASS WORKS,
6 4* No. 13 East Seventh street, Cincinnati.

BURGH'S PRACTICAL RULES FOR PROPORTION OF LAND AND MARINE ENGINES AND BOILERS.—NOW READY.

PRACTICAL RULES
FOR THE
PROPORTION OF MODERN ENGINES AND BOILERS
FOR
LAND AND MARINE PURPOSES.
By N. P. BURGH, Engineer.
12mo. Price $2.
By mail, free of postage.

SYNOPTICAL INDEX.

HIGH-PRESSURE ENGINE—Cylinder; Cross Head or Connecting Pin; Connecting Rod; Crank and Shaft; Designing; Eccentric; Eccentric Rod, Band and Bolts; Fly Wheel; Feed Pump; Feed Pump, Relief Valve; Guide Block; Governor; Horse Power (Nominal); Main Framing; Power; Power (Actual); Piston; Piston Rod; Stuffing Box and Gland; Steam Port (Supply); Slide Valve; Slide Casing.

BEAM ENGINE (CONDENSING)—Beam; Beam, Wrought Iron; Cylinder, Thickness; Crank, Cast Iron; Crank Shaft; Crank, Wrought Iron; Condenser; Eccentric Rod; Fly Wheel; Gear for Working Slide Valve; Pumps, Air and Feed; Parallel Motion; Ports; Power.

MARINE SCREW ENGINES—Air Pumps; Air-pump Piston; Banjo Frame; Cylinder; Condenser; Connecting Rod; Connecting Rod, Single Ends; Crank and Shaft; Casing (Valve); Common Slide Valve; Common Slide; Common Equilibrium Slide; Coupling, Wrought Iron; Donkey Engine; Exhaust Steam Pipe; Eccentric Rods, Bands and Bolts; Exhaust Relief Slide Valve; Exhaust Relief Equilibrium Slide Valve; Equilibrium Slide Valve; Frame, Banjo, for Large Engines; Feed Pump; Frame, Main; Frame, Banjo, for Small Engines; Guide Blocks; Guide Block, Common; Guide Frame; Griffith's Screw Propeller, Proportions of; Injection Valve; Injection Area; Power, Nominal; Piston; Piston Rod, and Stuffing Box; Power for Screw Propeller; Slide Valve Link Motion; Solid Link; Screw Propeller; Screw Propeller, Pitch of; Screw Propeller, Griffith's Patent; Stern Bracket; Surface Condensation; Stern Tube and Stuffing Box; Thrust Block and Screw Shaft; Turning Gear and Coupling; Twin Screw Propulsion; Valves, for Air Pump; Valve Seating; Valves, Arrangement of.

OSCILLATING ENGINES—Air Pump: Condenser; Crank Shaft; Crank Pin; Cranks; Cylinder; Thickness of Metal; Disengaging Gear; Entablature; Length of Stroke; Lower Frame; Power, Nominal; Piston Rod; Paddle Wheels; Paddle Wheels, Feathering; Starting Gear for Screw and Paddle Engines; Starting Gear, Position of; Trunnions and Steam Passages.

VALVES, ETC.—Cylinder Relief Valve; Expansion Valve; Exhaust Water Valve; Kingston Valve.

LAND AND MARINE BOILERS—Land Boilers, Proportions of; Lifting Gear for Funnel; Marine Boilers; Safety Valve, Land; Safety Valves, Marine; Superheating.

MISCELLANEOUS—Coal Bunkers, Marine; Decimals, Etc.; Eccentric, Position of, for Land Engines; Eccentric, Position of, for Marine Screw Engines; Fire Bars; Keys and Cotters; Link for Land Engine, Radius of; Levers; Link for Oscillating Engine, Radius of; Proportions of Connecting Rods having Strap Ends; Paddle Wheels, Centers of Radius Rods; Plummer Blocks; Proportion of Steam Cocks with Plugs secured by Nuts and Screws; Proportion of Marine Cocks; Proportions of Bolts, Nuts, Etc.; Proportions of Pins, Studs, Flanges, Etc.; Proportions of Copper Pipes; Proportions of Engines; Sliding Quadrant; Toothed Wheels (Gearing).

PROPORTIONS OF ENGINES PRODUCED BY THE RULES.—PROPORTIONS OF AN ENGINE 20-HORSE POWER (NOMINAL)—Cylinder; Cross Head or Connecting Pin; Connectiug Rod; Crank and Shaft; Eccentric; Eccentric Band and Bolts; Framing, Main; Fly Wheel; Feed Pump; Feed Pump Relief Valve; Governor; Guide Block; Piston; Piston Rod; Ports; Slide Casing.

PROPORTIONS OF A CONDENSING BEAM ENGINE 150-HORSE POWER (NOMINAL)—Cylinder; Connecting Rod; Crank Shaft; Crank; Fly Wheel; Gear for Working Valves; Main Beam; Parallel Motion; Pumps.

PROPORTIONS OF A PAIR OF MARINE ENGINES OF 200-HORSE POWER (COLLECTIVELY)—Air Pump; Banjo or Lifting Frame; Coupling; Cylinder; Condenser; Connecting Rod; Crank and Shaft; Eccentric Bands, Bolts and Rods; Feed Pump; Guide Block; Guide Frame; Link (Solid); Main Frame; Piston; Screw Propeller; Stern Tube and Stuffing Box; Stern Bracket; Screw Shaft Block; Slide Valve; Thrust Block; Turning Gear and Coupling; Valve Casing; Valves.

PROPORTIONS OF A PAIR OF OSCILLATING ENGINES OF 400-HORSE POWER (COLLECTIVELY)—Air Pump and Condenser; Cylinder; Crank Shaft; Crank Pin; Cranks; Entablature; Lower Frame; Paddle Wheel; Paddle Wheel, Details of; Trunnions and Steam Passages.

PROPORTIONS OF BOILERS—Proportions of a Land Boiler 20-Horse Power; Proportions of a Marine Boiler 200-Horse Power; Safety Valve; Superheating; Signs (Algebraic); Table of Specific Gravities; Table of Circles (inches); Table of Circles (feet); Water, Gravity of.

☞ The above or any other of my Practical and Scientific Books sent by mail, free of postage.

My New Catalogue sent free of postage to any one who will favor me with his address.
HENRY CAREY BAIRD,
Industrial Publisher,
7 No. 406 Walnut street, Philadelphia.

MILLER'S IMPROVED DRYING KILN.—PATENTed Sept. 13, 1864.—This kiln is applicable to the Drying of Grain, Corn, Malt, Flour, Fruit, Vegetables, Herbs, Roots, Paper, Wool, Cloth and other materials. It will also dry a larger quantity with less fuel, in a more uniform and thorough manner, than any other kiln, without hand labor. For further information apply to
JOSEPH A. MILLER, No. 200 Broadway.

OFFICE OF THE UNION DESICCATING CO., No. 56 South street, NEW YORK, Sept. 1, 1864.

MR. JOSEPH A. MILLER—My Dear Sir:—I can cheerfully certify that the furnaces you erected at our works for the purpose of drying fruits and other vegetable matter exceed my most sanguine expectations. For the last five years I have been using steam heat, and the saving of fuel between that process and yours is fully one-half, to say nothing of the difference of labor, and being able to have the heat under perfect control.

I shall give you an order for two more in the course of a few days.
Respectfully yours,
7 1* P. H. COPLAND, President.

AGENTS WANTED—TO SELL AN ARTICLE needed in every family. Will pay from $50 to $125 per month. For particulars address W. S. HILL,
6 5* Manchester, N. H.

ANALYSIS.—LODI LABORATORY IS PREPARED to give analysis of Ores, Minerals, Commercial Articles, &c., on the shortest notice.
Office No. 156 Chambers street, N. Y. 6 6*

MILL STONE DRESSING DIAMONDS SET IN Patent Protector and Guide.—For sale by JOHN DICKINSON, Patentee and Sole Manufacturer and Importer of Diamonds for all Mechanical purposes. Also, Manufacturer of Glazier's Diamonds, No. 64 Nassau street, New York City. Old Diamonds reset. N. B.—Send postage stamp for Descriptive Circular of the Dresser. 4 12*

OFFICE OF INVENTOR'S ASSOCIATION, No. 61 BLEECKER STREET (East of Broadway), N. Y. City.

STACKPOLE, WENDELL & COBB, INVENTORS, Manufacturers and Wholesale Dealers in Patented Articles, Patent Rights Sold on Commission. 6 2*

STEAM DRYING APPARATUS FOR SALE.—A large machine, capable of drying perfectly from 40 to 50 bushels of Corn Meal, Grain or Malt per hour, with the escape steam of an engine. Address JOHN S. SNEAD & CO.,
5 3* New Albany, Ind.

STEAM BOILERS SET ON THE BEST PRINCIPLE to save fuel; Improved Fire Fronts and Indestructible Grate Bars for all kinds of boilers. JOSEPH A. MILLER. C. E., No. 200 Broadway. 5 5*

GIROUD'S PATENT MARINE CLOCKS AND REGISTERS. Also manufactory of Water Gages. Steam and Vacuum Gages and Brass Work in general manufactory.
V. GIROUD & CO., No. 191 Lewis street.
5 4* Office Davison, Stiles & Woolsey, No. 229 Broadway.

FITT'S CELEBRATED STEAM GONG CAN BE heard thirty miles. The best kind of an alarm. Its cost $100 including valve.
STEAM BOILER FEEDER CO., Worcester, Mass., are the only manufacturers. 4 5*

© 1865 SCIENTIFIC AMERICAN, INC.

THE CHEAPEST MODE OF INTRODUCING INVENTIONS.

INVENTORS AND CONSTRUCTORS OF NEW AND useful Contrivances or Machines, whatever kind, can have their inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no second-hand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. It is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars address—

MUNN & CO.,
Publishers of the SCIENTIFIC AMERICAN,
No. 37 Park Row, New York City

DEL. LIT. INST. ENGINEERING SCHOOL, AT Franklin, Delaware Co., N. Y.—Advantages—Full set best Engineering Instruments, worth $1500; Laboratory, fitted up with furnace, still, balance, &c.; full set Reagents for analysis; full set Mineral Specimens; $200 pays Board, Books and Tuition one year. GEO. W. JONES A. M. (Yale Col), Prof Math., Instr. in Field Work. W. A. ANTHONY, B. Ph. (Yale Col.), Prof. Nat. Sci., Instr. in Drawing. 3 12*

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 3 tf

---

TO PETROLEUM OIL MANUFACTURERS.—INFORMation on the fabrication of coal and petroleum oils; processes to refine, purify and deodorize them; plans of factories, drawings of apparatus; preparation of lubricating oils, colors of coal tar, salts of ammonia; process to treat refuse of oil factories. Address Prof. H. DUSSAUCE, Chemist, New Lebanon, N. Y. 5 2*

VOLS. VI., VIII. AND IX., "SCIENTIFIC AMERICAN" (new series) WANTED, for which a suitable price will be paid. CHAS. H. GREENLEAF, 247 South 3d-st., Phila., Pa. 5 3*

COTTON GINS WANTED FOR EXPORTATION.—Address, with price and description, for ten days, H. F. S, Box 1469, New York. 5 3*

FOR SALE.—NEWBURGH IRON AND BRASS Foundery, Machine and Blacksmith Shop, Tools, Patterns and the entire Fixtures are offered for sale at a bargain, the proprietor wishing to retire. Address J. H. C., Post-office Box No. 54, Newburgh, N. Y. 5 4*

Wrought-iron pipe, globe valves & cocks, pipe fittings, steam and gas-fitters' tools. John Ashcroft, 50 John st, New York. 1 11

MACHINISTS WHO ARE DESIROUS OF IMPROVING their condition in life by entering the United States Navy as Engineers, at $1,108 per year, can do so without failure. Address, with two stamps, J. HARRIS, No. 355 North Tenth street, Philadelphia, Pa. 6 6*

RARE CHANCE

FOR PARTIES WISHING TO ENGAGE IN THE MANUFACTURING BUSINESS.—The advertisers having three large establishments manufacturing Agricultural Machinery would dispose of one at Rochester, N. Y., on very favorable terms. Owing to the great increase in the demand for this class of machinery it makes more business than they can attend to.

Full particulars promptly given by addressing P. O. Drawer, No. 76, Rochester, N. Y. 6 4*

FOR BEDSTEAD AND FURNITURE MACHINERY, Friezzing, Shaping and Molding Machines, address J. A. FAY & CO., Cincinnati, Ohio. 3atf

---

FOR PATENT SCROLL SAWS, RAILWAY CUTTING-OFF SAWS, Splitting Saw Tables and Arbors, Edging Saws, &c., address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

---

PATENT OFFICE AND EVERY VARIETY OF Working Models and Experimental Machinery; also Patterns of all kinds, made by V. GIROUD & CO., No. 191 Lewis street, office Davison, Stiles & Woolsey, No. 2 9 Broadway. 5 4*

THE GREAT AMERICAN HOG-TAMER'S OFFICE,
Headquarters MORRISON, ILL.

TO FARMERS ENGAGED IN GROWING HOGS OR Wool, and also dealers in Hardware, who will send me their names and Post-office address I will forward my descriptive pamphlets or circulars free, containing information of value to them.

Address REUBEN HURD,
6 3* Morrison, Whiteside Co., Ill.

FOR SALE.—ONE PAIR OF ENGINES, 30-IN. BORE, 54-in. stroke, built by J.P. Norriss, Philadelphia, in perfect order; one 22 by 6 dm. both; can be run high or low pressure; one 17½ by 42; one 16 by 16 all in complete order. Cylinder and Flue Boilers for sale to suit.

Machinery for Sawing, Cutting and Rubbing Marble, at
DAVIS'S MACHINERY YARD,
6 3* Nos. 17 and 19 Morris street, J. C.

EVERY SAWYER AND LUMBERMAN SHOULD have the Sawyer's Companion, a copy of which will be sent by return mail on receipt of $1 50 by the subscriber. S. E. PARSONS, Wilkes Barre, Luzerne Co., Pa. 6 3*

VALUABLE DISCOVERY.—IT HAS BEEN ASCERtained that Railroad Ties may be preserved for a great length of time by the application to them of a composition discovered and lately patented by B. S. FOREMAN, Architect and Builder, at Morrison, Ill. 6 10*

FOR SALE.—STATE RIGHTS OF THE WHOLE OF a valuable Patent just granted for a new material for Mills for Grinding all kinds of Grain, Coffee, Spices, &c. Address C. RANDS, care of Mr. Bridgens, No. 189 William street, New York. 6 4*

INCRUSTATIONS.—WINANS'S CHEMICALS, A CERtain prevention of scales. Satisfactorily used 8 years. Cost about 10 cents daily. H. N. WINANS, No. 11 Wall st., N. Y. 6 4*

FOR SALE.—ONE 3-SPINDLE JIGGING OR SHAPing Machine, nearly new. Also one second-hand Screw Cutting Lathe. Will swing 18 inches; 6 feet 6-inch shears. HENRY DISSON, Keystone Saw and Tool Works, Philadelphia. 6 3*

FOR SALE.—REED'S IMPROVED HAY-RIGGING State and County Rights. Illustrated in No. 6, Vol. XII. Address REED & CHESEBRO, Grand Rapids, Mich. 6 5*

J. A. FAY & CO.,
CINCINNATI, OHIO,
Patentees and Manufacturers of all kinds of
PATENT WOOD-WORKING MACHINERY
of the latest and most approved description.
particularly designed for

Navy Yards	Sash, Blind and Door,
Ship Yards,	Wheel, Felly and Spoke,
Railroad,	Stave and Barrel,
Car and	Shingle and Lath,
Agricultural Shops,	Planing and Resawing,
Mills, &c.	

Warranted superior to any in use. Send for Circulars.
For further particulars address J. A. FAY & CO.,
Corner John and Front streets,
Cincinnati, Ohio,
Who are the only manufacturers of J. A. Fay & Co.'s Patent Wood-Working Machinery in the United States. 3 1y

---

OIL! OIL! OIL

For Railroads, Steamers, and for machinery and Burning, PEASE'S Improved Engine Signal, and Car Oils, indorsed and recommended by the highest authority in the United States and Europe. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American," after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No. 61 and 63 Main street, Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the world. 1tf

WANTED—FOR THE STATES OF MASSACHUsetts, Rhode Island and Connecticut, Manufacturers of the One-horse Mower, "Cayuga Chief," No. 4, which is perfectly adapted to the wants of New England Farmers. It has double driving wheels, flexible finger bar, and folding cutting apparatus. Is capable of cutting with a medium-sized horse, in a workmanlike manner, two-thirds as many acres of grass per day as the best two-horse mower. Has been successfully introduced in Maine and New Hampshire, by Messrs. Woodman & Burnham, of Biddeford, Maine, who manufacture for those States.

The two-horse mower, "Cayuga Chief, Junior," or No. 3, can also be manufactured in connection with the one-horse for the same territory, if desired. Address

C. WHEELER, JR.,
5 4* Poplar Ridge, Cayuga County, N. Y.

RUFUS CHANDLER & CO. (SPRINGFIELD, MASS.), manufacturers of all kinds of MACHINE SCREWS, also STEEL SLIDE GAGES, other machinists' tools, and small machinery generally. 25 7*

PATENT EXCHANGE.—ESTABLISHED FOR THE convenience of INVENTORS and BUSINESS MEN. Genius and Enterprise. We make the introduction and sale of Patents our study and profession. Terms given upon application. T. G. ORWIG & CO., 229 Broadway, New York. 25 tf

---

ANDREWS' PATENT OSCILLATING ENGINES ARE compact, strong, light, durable, simple and economical. We make them double and single of twenty sizes, from one-half to 250 horse-power. They leave the shop set up ready for use and require no foundation. For particulars and prices (which are low) address

WM. D. ANDREWS & BRO.,
25 8* 414 Water street, New York.

BLAST MACHINERY FOR SALE.—TWO VERTICAL Blowing Cylinders, 40 inches diameter, 36 inches stroke, in fair order. Apply to MERRICK & SONS, Philadelphia. 24 tf

---

MACHINISTS' TOOLS, ENGINE LATHES, HAND Lathes, Planers, Upright Drills, etc., of best material and superior workmanship, manufactured and for sale by WM. M. HAWES & CO., Fall River, Mass. 25 12*

$2,000 A YEAR MADE BY ANY ONE WITH $15. Stencil Tools. No experience necessary. The Presidents, Cashiers and Treasurers of three Banks indorse the circular. Sent free with samples. Address The American Stencil Tool Works, Springfield, Vt. 25 tf

---

GRINDSTONES OF THE BEST QUALITY MANUFACTURED for Mechanics, Railroad Shops, Manufacturers and the Trade. Address orders to F. M. STEARNS & CO., Berea, Ohio. 1 tf*

STEAM AND WATER GAGES, SCOTCH GLASS Tubes, Low Water Detectors, Ratchet Drills, Stocks and Dies, Boiler Felting JOHN ASHCROFT, 50 John street, New York. 1 11*

ELASTIC RODS FOR THE TEETH OF THE WHEEL-Horse Rake. Address ELBERT WHITE, Stamford, Conn. 5 4*

FOR DANIELS'S PLANING MACHINES, CAR MORTISING, Boring Machines, Car-Tenoning Machines, Car Planing and Beading Machines, &c., address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

---

E. H. BELLOWS, MANUFACTURER OF STEAM Engines and Boilers. A new 5 horse-power portable engine for sale.
Worcester, Mass. 1 7*

FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machines address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

---

BAILEY'S PATENT ICE CREEPER.—CREEPERS or Patent Right for sale. See illustration, page 192, Vol. VIII., new series, SCIENTIFIC AMERICAN. GILBERT L. BAILEY, Portland, Maine. 23 5eow*

GALVANIZED IRON.—GALVANIZING DONE WITH despatch and castings furnished if desired, either Malleable or Gray Iron. Address WILCOX & HALL, Middletown, Conn. 23 26 eow*

FOR SALE.—ONE MULEY SAW MILL, WITH A 20 foot carriage and 7-foot saw, $600; one Re-saw Machine, 4 rolls, 5-foot saw, $400; one Axe Handle and Spoke Lathe, $225. Address J. A. FAY & CO., Worcester, Mass., or E. C. TAINTER, Succeeding Partner. 25eow

---

MACHINERY.—S. C. HILLS, No. 12 PLATT STREET New York, dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning and Sash Machines; Woodworth's and Daniels's Planers, Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting Oil, &c. c

---

STEAM ENGINES, MACHINERY, ETC.—STEAM ENGINES from 10 to 150-horse power, with link motion, variable cutoff, of the most approved construction; also lathes, mill-gearing, shafting, hangers, etc., and Machinery in general. Address

4 XII., 1y M. & T. SAULT, New Haven, Conn.

PECK'S PATENT DROP PRESS MANUFACTURED in all its varieties, by M. & C. PECK & CO., Founders and Machinists, New Haven, Conn. 16 26*

A MESSIEURS LES INVENTEURS.—AVIS IMPORTANT Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence. MUNN & CO.,
Scientific American office, No. 37 Park-Row, New York.

A VALUABLE WORK FOR INVENTORS PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—

The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade-marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Re-issues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions.

It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the PATENT LAW and PRACTICE, but to answer a great variety of questions which have been put to them from time to time during their practice of upwards of *seventeen years*, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps.

Address MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, No. 37 Park Row New York.

HARTMANN & LAIST, 64 SYCAMORE STREET, Cincinnati, Ohio, Manufacturers of Glycerine for Gas Meters, Hydraulic Presses, etc. Warranted not to freeze at the lowest temperature. Glycerine for Perfumers, Tobacco Manufacturers, Printers, Druggists, etc. Asetic Acid, Acetate of Lime. Acetate of Soda at the lowest prices. PAUL BALLUFF, Agent, 95 Maiden Lane. 2 16*

WATER WHEELS.—THOSE WHO WISH TO GET a large amount of power from a small quantity of water should use Warren's Turbine Water Wheel. For circulars, &c., address A. WARREN, Agent, American Water Wheel Company, 31 Exchange street, Boston, Mass. 2 12*

FOR SALE.—STATE OR COUNTY RIGHTS OF THE American Mower. The best Mower in use, combines all the improvements which make a perfect Mower. WM. VAN ANDEN, Poughkeepsie, N. Y. 6 3*

PAGE'S PATENT PERPETUAL DRAW BRICK AND Lime Kiln. Brick Kiln will burn 40,000 No. 1 Brick per day, with four cords of wood or two tuns of soft coal. Lime Kiln will burn 300 bushels with three cords of wood or two tuns of coal. Address C. D. PAGE, Cleveland, Ohio. 1 8*

IMPORTANT TO HORSE RAKE MANUFACTURERS. —The subscribers, yielding to the solicitations of many manufacturers of Horse Rakes, have at length completed arrangements for furnishing Rake Teeth of any shape desired, bent and tempered to any pattern. We have no hesitation in assuring Rake Manufacturers that they can now rely upon procuring from us good reliable Teeth, of very superior temper, and in any quantity, on short notice. We furnish, in addition to the ordinary sizes of Round Teeth, Sprout's Patent Shape Teeth, for which we have the exclusive right of manufacture. We annex List of Sizes:—7-16 inch Round, No. 1; 13-32 inch Round, No. 2; 3-8 inch Round, No. 3; Sprout's Patent, No. 1; Sprout's Patent, No. 2; Sprout's Patent, No. 3. Extra price for all Teeth over 5 feet in length, also when a coil or spring is made on the tooth. Nos. 1, 2 and 3, Sprout's Patent, correspond for strength with the same Nos. of Round, and are much lighter and more elastic. Our Teeth are all tested before leaving the shop, and warranted to be a perfect spring temper. Parties ordering Teeth should be careful to send pattern. We also furnish Rake Steel to order, cut to lengths, at lowest market rates. Terms cash. HUSSEY, WELLS & CO., Pittsburgh, Pa., Manufacturers of best Refined and all descriptions of Cast-steel. 1 13*

WANTED.—$125 A MONTH! AGENTS EVERYwhere, to introduce the new Shaw & Clark $16 Family Sewing Machine, the only low price machine in the country which is licensed by Grover & Baker, Wheeler & Wilson, Howe, Singer & Co., and Bachelder. Salary and expenses, or large commissions allowed. All other Machines now sold for less than forty dollars each are infringements, and the seller and user liable. Illustrated circulars sent free. Address

23 12* SHAW & CLARK, iddeford, Maine.

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

---

INVENTORS IN WANT OF CASH CAPITAL TO introduce their inventions can hear of a party who will furnish any reasonable amount, by addressing W. B. G., Box 5,722, New York.

N. B.—None need apply unless having really useful articles. Give description. 21 12*

FOR SALE.—ONE FLUE BOILER, 30 FEET LONG by 45 inches diameter, with two 14-inch return flues, including boiler front, bonnet, pipes, valves, etc., all complete; has been in use about five years, and is in good condition. Please address Plant's Manufacturing Company, New Haven, Conn. 21 tf

---

REYNOLDS' TURBINE WATER WHEELS.—COMPETENT men are employed to measure streams, make plans, and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York. 1 XII.1y*

$70 A MONTH! I WANT AGENTS EVERYWHERE, at $70 a month, expenses paid, to sell Fifteen Articles, the best selling ever offered. Full particulars free. Address OTIS T. GAREY, Biddeford, Maine. 22 13*

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York.

GUN AND PISTOL SCREWS.—COMSTOCK, LYON & CO., Manufacturers (Office, 74 Beekman street, New York), are always prepared to furnish Gun and Pistol Screws to sample. Screws to fit the U. S. Musket, Sewing Machine Screws, and Metal Screws generally, of the best quality, at short notice. 16 26*

HOLSKE & KNEELAND, MODEL MAKERS. PATENT Office Models, Working Models, and Experimental Machinery, made to order at 528 Water street, near Jefferson street, New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 1tf

---

Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.
Daselbst ist zu haben:

Die Patent-Gesetze der Vereinigten Staaten,

nebst den Regeln und der Geschäftsordnung der Patent-Office und Anleitungen für den Erfinder, um sich Patente zu sichern, in den Ver. Staaten sowohl als in Europa. Ferner Auszüge aus den Patent-Gesetzen fremder Länder und darauf bezügliche Rathschläge; ebenfalls nützliche Winke für Erfinder und solche, welche patentiren wollen.

Preis 20 Cts., per Post 25 Cts.

© 1865 SCIENTIFIC AMERICAN, INC.

A Great Country for Americans.

According to the London correspondent of the *Herald*, England is a favored land for Americans and American inventions. This is what the individual in question says :—

This great, great, very great country of Great Britain would like to be quite independent of the United States of America, and hear no more of her in any form. But your presence is felt every day, morally, socially, politically, commercially, financially and in every other way. Your corn fields supply them with bread, your ships bring it to them and carry away their products and their surplus population ; your cotton keeps their manufactures in a flourishing condition, or did, and gives them a large sum for their Treasury. In machinery they are indebted to you to an almost endless extent. Perhaps they divide with you—as each nation claims both inventions—the honor of developing steam power and making the lightning telegraph. American mowing and reaping machines cut down their grass and gather their harvest, while American invented cotton gins are made here to send to India, China, Australia, Egypt, Southern Europe, Northern Africa and South America. Hoe's New York printing machines work off all their largely circulated newspapers and periodicals, and one daily journal boasts that with stereotyped forms their "Hoe" prints eighty thousand copies an hour. There never was a nail machine to make cut nails in the kingdom till about thirty years ago, when one was brought from America.

I suppose you've seen a nail machine,
'Tis all the people's wonder, O;
It thumps away both night ahd day,
And makes a noise like thunder, O.
Such cracks and jams, like batteriug rams,
Which keep such a pelting, pouncing, O,
That all the ground it shook around,
By reason of the jouncing, O.

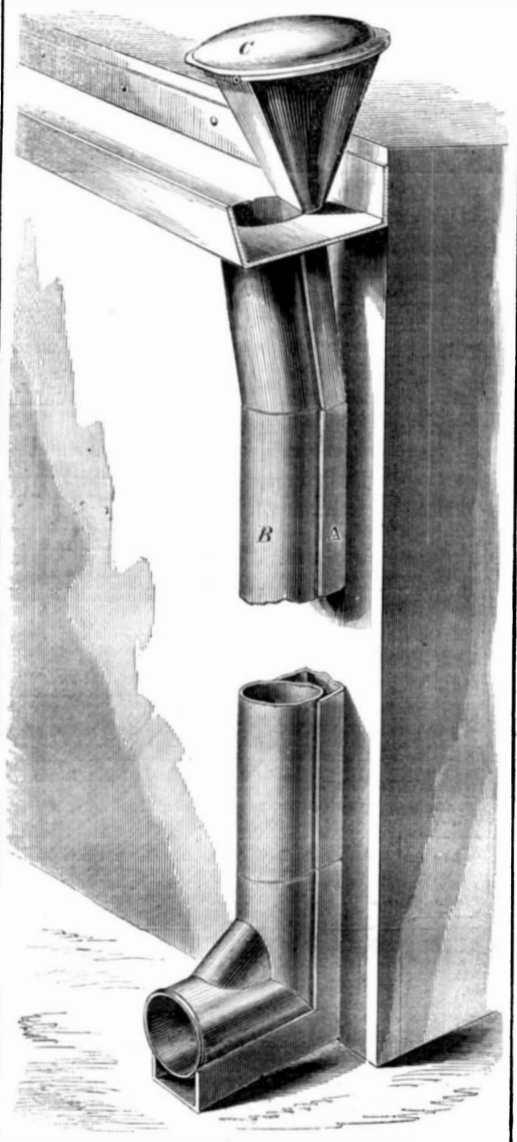
The rifles they make to fight their enemies are all fabricated by machinery invented by a Yankee and made in Connecticut. Every city, town, village and hamlet, and half the habitations, from the lordly castle and mansion to the peasant's cottage, are supplied with New England clocks. Their bank vaults and safes, to be safe at all, must be secured by American locks. At least three hundred thousand American sewing machines are in constant use to make their clothing, affording large incomes or gigantic fortunes to nearly a dozen American patentees and manufacturers. One extensive manufacturing firm—the house of Welch, Margetson & Co., of Cheapside, who make collars and neck ties by the million—employ some twelve hundred sewing machine hands, and work nearly a thousand machines, and they have found it expedient to manufacture their own machines, making one of combined action from expired patents and minor inventions that they have purchased. All the planing and wood dressing machines in use are of American invention. After being beaten in every water clear round the world from the Isle of Wight to Botany Bay, they copied your yachts and clipper ships; and now they are making monitors and cupola ships to replace their old tubs of iron and wood that are found to be useless. Your thousand pounder guns they will have to copy soon, as they have nothing to equal or come near them.

An enterprising American named Thompson, comes here with one of the grandest inventions, that would build boats in hours that formerly repuired days, which reduced the cost one half, and would have tripled the number built, so they could have supplied the world; but no sooner was a company formed to utilize the invention and fairly at work, than their inefficient laws and loosely-organized and lawless combinations of hand-grubbing laborers got up mobs, broke the machinery and ruined the company, after they had spent half a million of dollars. not one dollar of which was saved.

American actors, actresses, opera singers, minstrels, lecturers, showmen, dwarfs and and other entertainers are realizing large incomes, while the spread and influence of American books and literature is increasing every year. Native born Americans come here, now and then, like Lyndhurst, and get to be peers, while several fair daughters of America are peeresses.

ROGERS'S RAIN CONDUCTOR.

Leader pipes are a source of great annoyance and expense in cold weather, for they frequently freeze up and burst, after which the water from the eaves drips down over the front of the building, rendering it unsightly, and injuring the masonry. The invention herewith illustrated is intended to supply a convenient means for thawing the leader pipe when frozen. If hot water be poured on at the top, it is soon as cold as the pipe itself. This invention provides for a pipe, A, at the back of the leader, B, by which the



hot water has free access or is in close contact with the pipe to be thawed, and thus accomplishes the object in a short time and with little trouble. The water is poured in through the funnel, C, and will not be liable to freeze in the pipe, A, through which it passes. A cap is provided to the funnel which excludes rain and snow therefrom, so that it is at all times open throughout its length. Patented Dec. 13, 1864, by F. P. Rogers, 1,431 Market street, Philadelphia. For further information address the patentee as above.

Distinguishing Features of the Cornish Engine.

"A Collier" writes the following interesting letter to the *London Morning Journal:*

Without doubt the Cornish engine and pumping arrangements are superior to any other in the United Kingdom, and I have seen every style in it. I have not a single remark to make upon it, but advise any one in want of a pumping engine to go to Cornwall, get a Cornish engine, plungers, boilers, and fit them up by Cornishmen, and work them by Cornish enginemen. I have seen attempts made to make them elsewhere, and all have been great failures, which I attribute to the tendency of a "native" to adopt some of his own hobbies. The modes of balancing, and of working expansively, are as near perfection as we shall get; and the systematized training of men, —at low wages, too, only 65s. per month—is worthy of imitation. The great points of the Cornish system, as already stated, are slow firing; careful cloth ing of engines, steam pipes, and boilers; expansion and condensation of steam; forcing sets and larg waterways; great strength (for steadiness) of rods and accurate balancing, which the use of balance bobs enables them to do so simply. Too little atten tion is paid to these points about collieries, and especially to size of rods and balancing, and it appears to me that the adoption of heavier rods, counterbalanced with balance-beams, would add much to the steadiness of our direct pumping engines. In "Bull" engines, or those where the cylinder stands directly over the pit, I believe the use of balance-beams would enable the steam to be used expansively, which is never done now, as far as I have observed. I was informed that this description of engine had been abandoned in Cornish mines for 50 years, in favor of the beam-engine now in use. Our best bell-crank arrangements, with rotary engines, consume at least four times the fuel of the ordinary Cornish engine. For example, the Cornish engine will do the work of an ordinary 20-in. cylinder high-pressure pit engine, working 24 4-ft. strokes for 24 hours, on 2 tons of coal.

TO

INVENTORS, MECHANICS, AGRICULTURALISTS.

THE ANNUAL

PROSPECTUS

OF THE

Scientific American.

THE CHEAPEST AND BEST

MECHANICAL JOURNAL IN THE WORLD,

A NEW VOLUME OF WHICH COMMENCED

JANUARY 1, 1865.

This valuable journal has been published nineteen years, and during all that time it has been the firm and steady advocate of the interests of the Inventor, Mechanic, Manufacturer and Farmer, and the faithful chronicler of the

PROGRESS OF ART, SCIENCE AND INDUSTRY

The SCIENTIFIC AMERICAN is the largest, the only reliable, and most widely-circulated journal of the kind now published in the United States. It has witnessed the beginning and growth of nearly all the great inventions and discoveries of the day, most of which have been illustrated and described in its columns. It also contains a WEEKLY OFFICIAL LIST OF ALL THE PATENT CLAIMS, a feature of great value to all Inventors and Patentees. In the

MECHANICAL DEPARTMENT

a full account of all improvements in machinery will be given. Also, practical articles upon the various Tools use in Workshop and Manufactories.

STEAM AND MECHANICAL ENGINEERING

will continue to receive careful attention, and all experiments and practical results will be fully recorded.

WOOLEN, COTTON AND OTHER MANUFACTURING INTERESTS

will have special attention. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Mechanics' Tools, Electric, Chemical and Mathematical Apparatus, Wood and Lumber Machines, Hydraulics, Pumps, Water Wheels, etc.

HOUSEHOLD AND FARM IMPLEMENTS,

this latter department being very full and of great value to Farmers and Gardeners; articles embracing every department of Popular Science, which everybody can understand.

PATENT LAW DECISIONS AND DISCUSSIONS

will, as heretofore, form a prominent feature. Owing to the very large experience of the publishers, Messrs. MUNN & Co., as SOLICITORS OF PATENTS, this department of the paper will possess great interest to PATENTEES AND INVENTORS.

The Publishers feel warranted in saying that no other journal now published contains an equal amount of useful information, while it is their aim to present all subjects in the most popular and attractive manner.

The SCIENTIFIC AMERICAN is published once a week, in convenient form for binding, and each number contains *sixteen pages* of useful reading matter, illustrated with

NUMEROUS SPLENDID ENGRAVINGS

of all the latest and best inventions of the day. This feature of the journal is worthy of special notice. Every number contains from five to ten *original engravings* of mechanical inventions, relating to every department of the arts. These engravings are executed by artists specially employed on the paper, and are universally acknowledged to be superior to anything of the kind produced in this country.

TERMS OF SUBSCRIPTION.

Per annum.....$3 00
Six months..... 1 50
Four months..... 1 00

This year's number contains several hundred superb engravings, also, reliable practical recipes, useful in every shop and household. Two volumes each year, 416 pages—total, 832 pages. SPECIMEN COPIES SENT FREE. Address,

MUNN & CO., Publishers,
No. 37 Park Row, New York City

FROM THE STEAM PRESS OF JOHN A. GRAY & GREEN.

© 1865 SCIENTIFIC AMERICAN, INC.